

ORIGINAL

VOL|2 EXECUTIVE SUMMARY
AND TECHNICAL PROPOSAL

CALIFORNIA HIGH-SPEED RAIL PROJECT

Design-Build Contract for
CONSTRUCTION PACKAGE 4

Proposal | RFP Number: HSR 14-32



CALIFORNIA
RAIL BUILDERS

EXECUTIVE SUMMARY



CALIFORNIA HIGH-SPEED RAIL PROJECT

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INTERNATIONAL CREDENTIALS AND U.S. RESOURCES

The California High-Speed Rail Construction Package 4 project is a complex mega-program that will contribute to a new transportation paradigm for California. During construction and upon completion, the project will also deliver substantial economic benefits to Californians and Central Valley residents. Working with the California High-Speed Rail Authority (Authority), California Rail Builders, including international high-speed rail (HSR) and U.S. design and construction experts, will design and construct the significant civil and structural work along the 21-mile alignment through agricultural lands to facilitate the future track, systems and stations work that will connect the state. We have developed an approach that includes numerous technical solutions that are cost-effective, schedule-sensitive and environmentally sound, and that will result in a safe, quality product with long-term maintainability. Our plan minimizes impacts to both the residential and agricultural communities and the traveling public, and includes a proactive approach to building productive working relationships with the numerous third-party participants involved. We are committed to partnering with you to exceed your goals and produce the state-of-the-art system you have envisioned.

Madrid – Extremadura HSR,
Merida – Badajoz Section, Spain



Ferrovial Agroman and Euroestudios have designed and/or constructed more than 1,210 miles of HSR.

Northwest HSR Corridor, Soto del Real to Segovia (Lot 4), Spain



Ferrovial Agroman installed crushing and aggregate classification plants to expedite the work on this \$556 million HSR project.

Combined, California Rail Builders brings more than 280 years of experience worldwide including 168 years in the U.S.

WORLDWIDE

- 37 offices
- 13,000 employees

U.S.

- 16 offices
- 1,500 employees
- Nearly 350 current, ongoing projects valued at more than \$6 billion

California Rail Builders brings together the HSR design expertise of Euroestudios and the HSR construction expertise of Ferrovial Agroman with significant local Central Valley construction experience from dedicated subcontractor Griffith Company. California Rail Builders, the proposer and lead contractor, is a yet-to-be-formed entity, anticipated to be a limited liability company organized in Delaware with Ferrovial Agroman US Corp as the sole equity member. Our team includes:

- California Rail Builders
- Ferrovial Agroman S.A.
- Ferrovial Agroman US Corp
- Euroestudios, S.L.
- OTHON, INC.

- Proposer and Lead Contractor
- Guarantor
- Equity Member
- Lead Designer
- Lead Designer

Although we will continue to build our team of consultants, subcontractors and suppliers to include hundreds of firms, our team currently includes the following firms:

- Bond and Kennedy, Inc. (SB/MB)
- G&C Equipment Corporation (SB/DBE/DVBE)
- Griffith Company
- JMA Civil, Inc. (SB/MB)
- Katch Environmental Inc. (SB/DVBE)
- MARRS Services Inc. (DBE/SB)
- Unico Engineering, Inc. (SB/DBE/MB)
- USC Supply (SB/DVBE)

- Procurement support
- Construction materials
- Construction support
- BNSF Railway coordination and special track design
- Environmental support
- Type I and Type II hazardous soils excavation and disposal
- Verification, validation and self-certification
- Construction materials

With the exception of the addition and deletion of various subcontractors (based on our evolving understanding of the project's requirements), there have been no changes in the proposer organization since the submission of our statement of qualifications.

ORGANIZED TO DELIVER

Our team is structured to respond directly to the Authority's goals under the leadership of talented Project Manager/Director Alvaro Gomez-Muro, who has led \$2 billion in design-build transportation projects in the U.S. and has more than 10 years of experience on HSR projects in Spain. Our team combines proven HSR engineering and construction practices with lessons learned and strategies for success — strategies that have been used successfully on previous HSR design-build projects around the world. We understand the unique design and construction requirements of HSR projects, and our design and construction concepts and mega-project management techniques will achieve your goals and exceed your expectations.

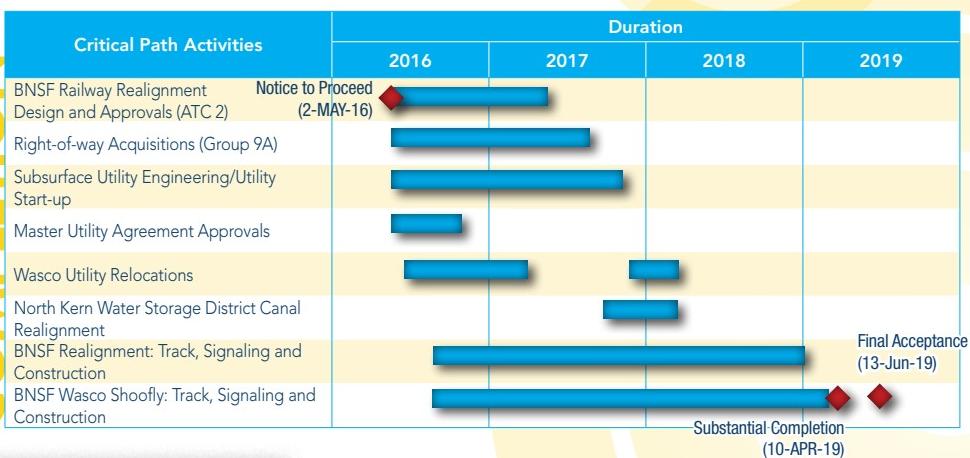
COMMITMENT

We will provide quality design and construction that fully supports the special requirements of HSR and the contract, meets or exceeds the expectations of the Authority and the project stakeholders, and considers community and local business input.

Our team includes:

- A quality organization that brings best practices for implementing a successful verification, validation and self-certification program from ongoing transit projects in Europe
- Cross-trained designers and constructors who have extensive design-build and HSR experience
- Staff at all levels who are empowered to ensure safety, quality and protection of the environment
- An approach to utility coordination that facilitates communication, identifies issues early and resolves issues before they impact the schedule
- A solid plan for working with BNSF Railway, the farmers and growers, the City of Wasco, local businesses including SunnyGem, Amtrak and Certis to mitigate short- and long-term impacts

ON-TIME COMPLETION



Our schedule will include activities and sub-activities for coordinating work with utility owners, BNSF Railway, Caltrans, Construction Package 2-3 and other private and public third parties.

FINANCIAL

California Rail Builders includes the financial strength and capability of one of the largest HSR design and construction organizations in the world.

Ferrovial Agroman US Corp and its affiliates reported revenues of \$675

million in 2014 and have a current backlog of \$1.66 billion. The company has an aggregate bonding capacity of \$5 billion with \$3.8 billion available. The projected 2015 volume is \$458.4 million. This team is more than capable of meeting the financial needs of the project. Our sound fiscal plan for doing so includes providing experienced senior financial managers on site overseen by a senior professional management team with decades of experience in mega-project finance and construction.



HIGH-SPEED RAIL EXPERTS

Our team has designed and constructed more than 65 high-speed rail projects totaling more than 1,200 miles.

High-speed rail is different from traditional heavy rail and light rail. The systems requirements are different. The structural requirements are different. We understand how to design the trackway and structures to accommodate the vibration of high-speed trains, and to integrate seamlessly with the future HSR stations and systems.

Northwest HSR Corridor, Baxán – Anzo Section, Spain



Madrid – Barcelona – French Border HSR, Lleida – Martorell, Spain

Madrid – Extremadura HSR, Merida – Badajoz Section, Spain



In addition to worldwide experience, Ferrovial Agroman is a member of the joint venture team providing design and preconstruction support for the \$400 million Texas High-Speed Rail program.

WHAT'S CRITICAL FOR HIGH-SPEED RAIL?

Quality Matters. Traveling at high speeds requires facilities that deliver little deviation in quality. A turn that is just a hair too tight, a slope that is a smidgen off or a rail bed that is out of level will decrease the speed at which the train can travel — from opening day through the end of the facility's life. Quality matters. We bring quality systems based on experience controlling, testing and verifying compliance with HSR requirements.

Our structural team understands that trains traveling at high speeds put more strain on structures and their joints due to the impact of vertical loads, dynamic effects, horizontal forces and aerodynamic effects — and our design reflects these considerations.

Verification, Validation and Self-certification

Overlying every aspect of the project will be our verification, validation and self-certification program. This all-encompassing program will consider each element of the project from collection of existing conditions, to the design and subsequent permits and approvals, to construction and commissioning.

Meeting Environmental Commitments

Our corporate culture fully integrates our quality and environmental programs. We will use our ISO 14001:2004-compliant environmental management system to ensure we meet all commitments, and our design process will be iterative, balancing transportation needs with environmental sensitivity, cost and schedule.

SCHEDULE TOP 5

- 1 BNSF Railway
- 2 Environmental Re-approvals
- 3 Third Parties
- 4 Right-of-way Acquisition
- 5 Farmers and Growers

KEY ENVIRONMENTAL CONCERNS

- 41 wildlife crossings
- 32,000 linear feet of wildlife fencing
- Preserving biological, cultural and archeological resources
- Minimizing stormwater quality, air quality and Waters of the U.S. impacts
- Limiting construction activities within certain hours to reduce noise



COMMITMENT TO THE C

Maximizing Small Business Participation

Including a commitment to achieving the 30 percent participation by small businesses, with at least 10 percent to DBE firms and three percent to DVBE firms, our small business participation program maximizes opportunities for small business firms. In addition to using small businesses during the procurement, we have already committed five percent of the contract amount to SB/DBE/DVBE/MB firms. Features of our plan include:

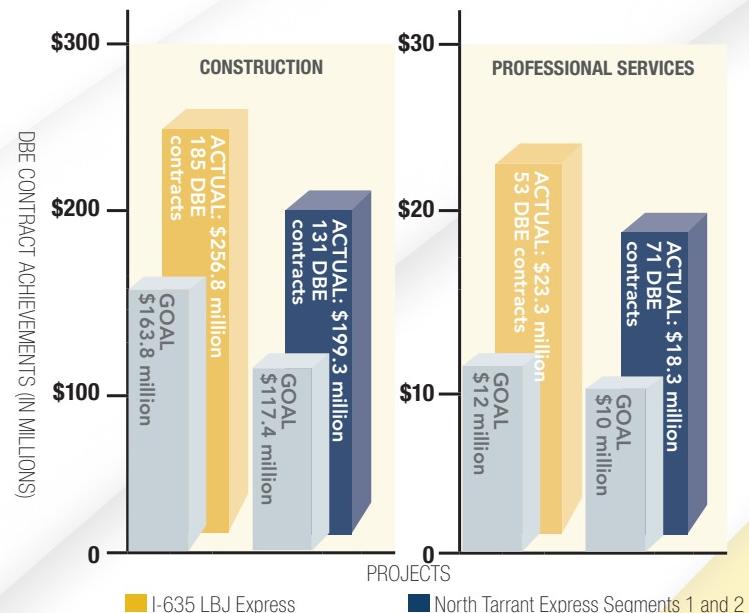
- A proactive and aggressive outreach program that includes public meetings, project newsletters and an up-to-date website detailing upcoming opportunities
- A requirement for all subcontractors to subcontract with small business firms
- A reporting process that captures second- and third-tier (and beyond) small business participation
- A commitment to training and mentoring small businesses, and expanding their capabilities

Our SB/DVBE/DBE/MB compliance officer will work closely with the Authority's small business outreach team to ensure our strategies are effective and the goals of the program are achieved.

Proven processes that maximize small and disadvantaged business participation.

Community Benefits Agreement

We will use targeted outreach and advertising to increase our reach to Community Benefits Agreement-targeted hires. We will meet with organizations that represent the targeted hires and implement a Spanish and English advertising program within affected communities.



SH 130 Segments 5 and 6



COMMUNITY

Local Commitment

This project will serve as an economic stimulant for the Central Valley. Our team includes subcontractor Griffith Company to help us navigate the local resources and stakeholders, and JMA Civil, Inc., a California microbusiness that will lead the critical BNSF Railway work elements. We commit to significant local hiring and subcontracting to local firms and will meet the goals established in the Community Benefits Agreement for national targeting hiring and the 30 percent small business goals including 10 percent participation by disadvantaged business enterprises and five percent for disabled veterans businesses.

Griffith Company is one of the leading suppliers of aggregates and asphalt in the Bakersfield area. They regularly use recycled asphalt in their asphalt mixes and have paved hundreds of miles of county and local roads in the project area.

Effective Traffic Management Solutions

Our material delivery and overall construction plan will be tailored to minimize impacts to traffic and adjacent properties. Designed to reduce "cone zone" construction periods, our traffic management plan minimizes community impacts and keeps traffic flowing smoothly and safely. Strategies we will employ include designing features into the project that eliminate impacts before they happen, installing additional signage beyond the minimum requirements and providing advance notification to the public at every opportunity. Our plan manages traffic and maintains access to businesses while maximizing safety for the traveling public and our workers.



Our team's successful public outreach program on this project was based on a boots-on-the-ground approach to engaging businesses and the community.

Public Outreach

Successful public outreach must be consistent, continually adapt to changes in public opinion and be open to input from stakeholder groups. We will collaborate with the Authority to develop a comprehensive public involvement program that informs, educates and engages the stakeholder groups and integrates the Authority's branding (such as #Iwillride).



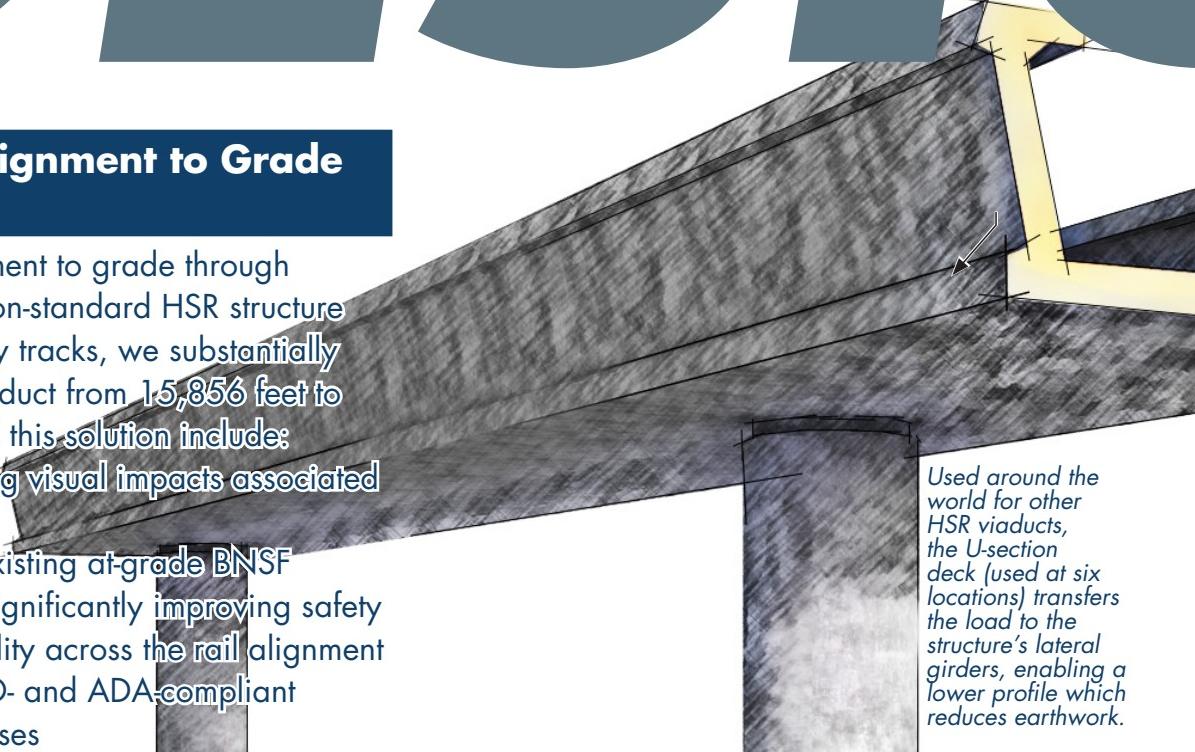
Our team partnered with several diverse industry groups, organizations and chambers to educate and reach out to the local workforce on this project. Additional outreach efforts were performed in conjunction with local schools, especially female students, regarding science, technology, engineering, mathematics and construction career opportunities.

SOLID TECHNICAL SOLUTIONS

Lowering the Alignment to Grade in Wasco

By bringing the alignment to grade through Wasco and using a non-standard HSR structure over the BNSF Railway tracks, we substantially reduce the Wasco Viaduct from 15,856 feet to 2,646 feet. Benefits of this solution include:

- Substantially reducing visual impacts associated with a tall structure
- Elimination of two existing at-grade BNSF Railway crossings, significantly improving safety and improving mobility across the rail alignment
- Addition of AASHTO- and ADA-compliant pedestrian underpasses



Used around the world for other HSR viaducts, the U-section deck (used at six locations) transfers the load to the structure's lateral girders, enabling a lower profile which reduces earthwork.

Our solution to convert 6th Street and Poso Avenue to underpasses eliminates two at-grade BNSF Railway crossings for improved safety.

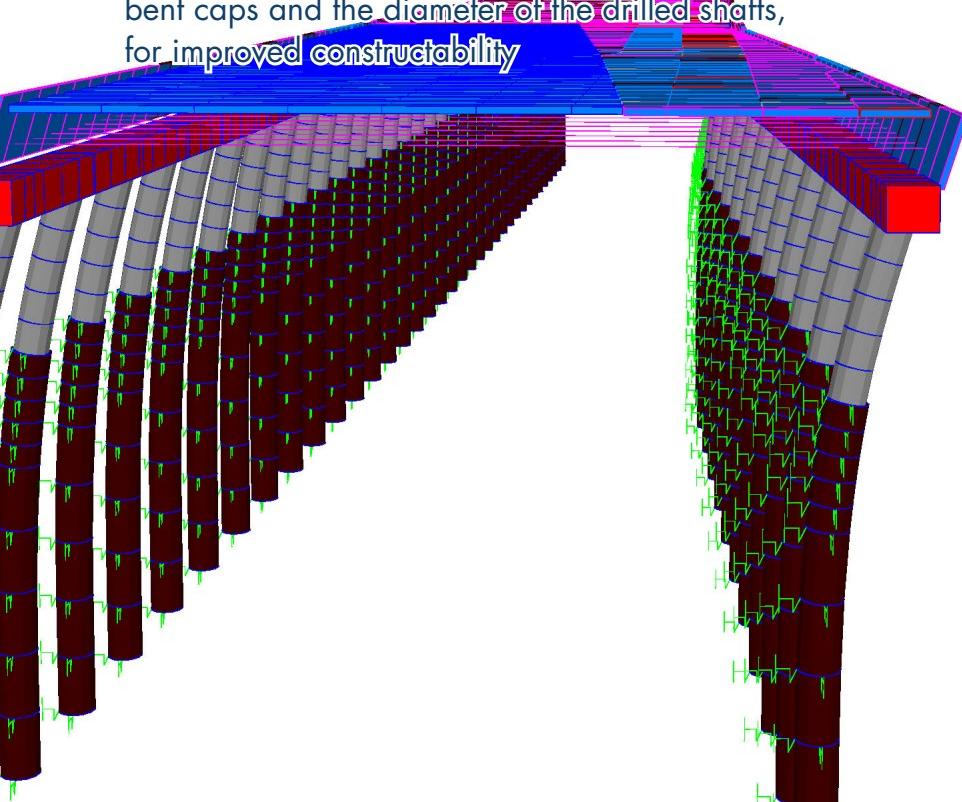


GN

Non-standard HSR Structure

The 3D model we developed for the non-standard structure that is part of the Wasco Viaduct provides a more accurate understanding of the structure's response, resulting in a design that provides a smoother HSR ride. The model also enabled us to develop refinements including:

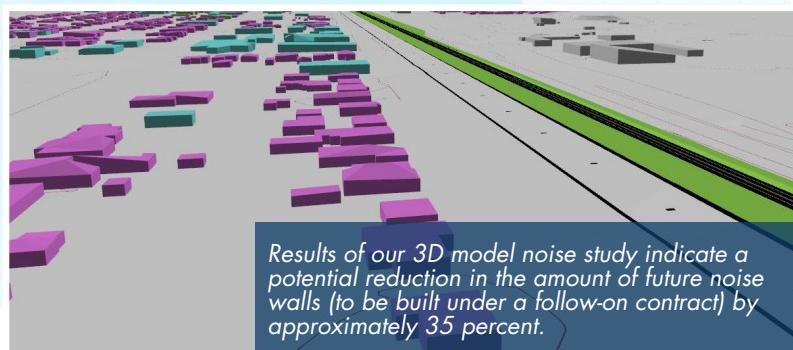
- Additional vertical clearance
- Fewer bridge joints, reducing bridge maintenance and the associated interruptions to rail operations
- Adjusting the size of structural elements such as bent caps and the diameter of the drilled shafts, for improved constructability



Advanced Noise Study

We conducted a detailed noise study, including a 3D model, that compared the original design to our alternative solution that brings the alignment to grade through Wasco. The results indicated no significant change in noise levels between the two and even identified noise mitigation improvements derived from our solution including:

- Noise reduction as a result of converting 6th Street and Poso Avenue to underpasses
- A reduction in the amount of noise walls to be built in follow-on construction packages
- Added mitigation for BNSF Railway noise



Results of our 3D model noise study indicate a potential reduction in the amount of future noise walls (to be built under a follow-on contract) by approximately 35 percent.



Our design includes surface enhancements and formliner texture/pattern treatments for the 6th Street and Poso Avenue underpass walls.

SOLID TECHNICAL SOLUTIONS

FOR CONSTR

Maintaining BNSF Railway Operations

Minimizing impacts to rail operations is critical to maintaining BNSF Railway's support and collaborative participation in the project. Our top-down approach to construction of the bridges over 6th Street and Poso Avenue will allow concurrent construction of the HSR and BNSF Railway alignments while maintaining full BNSF Railway operations.

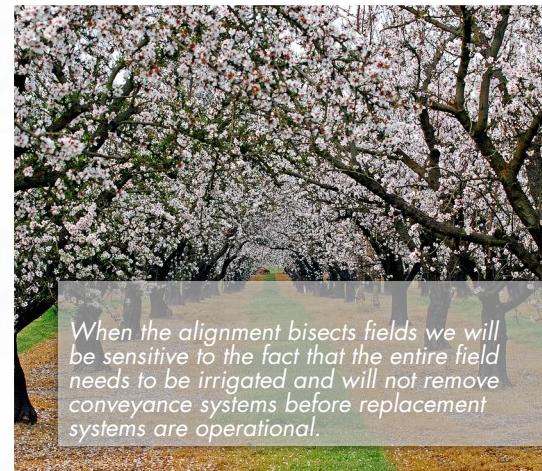


We will foster a constructive working relationship with BNSF Railway and the California Public Utilities Commission by executing well-planned operations and ensuring required approvals for grade separations are in place prior to the start of construction.

Mitigating Agricultural Impacts

We are keenly attuned to the needs of the local growers, farmers and related businesses, and will draw on Griffith Company's extensive experience and established relationships to minimize or eliminate impacts to crops.

We will work closely with the local farmers and growers to minimize detrimental impacts from dust, in particular, on grapes, blooming fruit and nut trees.



When the alignment bisects fields we will be sensitive to the fact that the entire field needs to be irrigated and will not remove conveyance systems before replacement systems are operational.

Madrid – Extremadura HSR, Merida – Badajoz Section, Spain



This project crossed protected agricultural sites including land for orchid farming and an irrigation line that was critical to the community's livelihood. Euroestudios modified the alignment of the new track to accommodate the orchid farm and coordinated the relocation of the irrigation utility to avoid disruption to the agricultural community.

STRUCTION

Value Engineering Solutions that Minimize Impacts

We have developed several value engineering solutions aimed at minimizing utility impacts. Examples include:

- Locating bridge support columns and retaining walls at Kimberlina Road, Poso Avenue and 6th Street to allow utilities to remain in place
- Adjusting the HSR alignment to allow the Semitropic Water Irrigation District water tower, pumps and manifolds, tank drains, chemical storage and several power and irrigation lines to remain in place
- Reverse stacking three HSR/roadway interchanges eliminating the need to reconfigure existing roads and saving almost 100 acres of right-of-way
- Providing shared utility trenches and ducts for underground dry utilities and shared overhead utility poles for overhead utilities, significantly reducing impacts and avoiding double trenches and double utility poles, if possible

With more than 100 years of experience, Griffith regularly resolves drainage, flood control and water conveyance issues in the area. Their experience working with stakeholders on these issues will be a valuable asset in addressing water conveyance challenges along the Construction Package 4 alignment.



We have already taken significant steps to progress the utility work. This effort, along with our 100-day plan, will enable us to jump-start this schedule-critical work.

This lifting device for placing concrete girders in reduced clearance conditions on the critical path is an example of the innovative construction techniques we bring to the Construction Package 4 project.



TECHNICAL PROPOSAL



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SECTION 1 |
**PROJECT
MANAGEMENT**



**CALIFORNIA
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TECHNICAL PROPOSAL

1. Project Management

The California High-Speed Rail Construction Package 4 project is a complex mega-program that will contribute to a new transportation paradigm for California. During construction and upon completion, the project will also deliver substantial economic benefits to Californians and Central Valley residents. Working with the California High-Speed Rail Authority (Authority), California Rail Builders (CRB) will design and construct the significant civil and structural work along the 21-mile alignment through agricultural lands to facilitate the future track, systems and stations work that will connect the state.

WHAT'S CRITICAL IN A HIGH-SPEED RAIL PROJECT?

We understand the Authority's ultimate goal is a high-speed rail (HSR) line that effectively operates at speeds up to 220 miles per hour. As experts in HSR, we have the project management approach, construction team, designers and quality processes to deliver the project.

QUALITY MATTERS. Traveling at high speeds requires facilities that deliver little deviation in quality. A turn that is just a hair too tight, a slope that is a smidgen off or a rail bed that is out of level will decrease the speed at which the trains can travel — from opening day through the end of the facility's lifespan. *Quality matters.* We bring quality systems based on experience controlling, testing and verifying compliance with HSR requirements.

COMMITMENT

CONTRACT-COMPLIANT PERFORMANCE

We will deliver a project that meets your contract requirements and satisfies the verification, validation and self-certification program.



Using project management strategies similar to those proposed for Construction Package 4, the I-635 LBJ Express design-build project (pictured above) finished three months early and the North Tarrant Express Segments 1 and 2 finished nine months early.





We've Done It Before

We have placed 450 miles of HSR track in Europe; hold several patents for machinery, technology and equipment related to efficient rail construction; and frequently serve as trackway subcontractors.

Because of this experience, we fully understand the HSR envelope requirements and its high-quality design and construction demands.

In the U.S., the Texas Central Partners recently chose our team (a joint venture between Archer Western Construction and Ferrovial Agroman) to begin design and preconstruction work for the Texas HSR program.



We will aggressively pursue innovative solutions such as this lifting device for placing concrete girders in critical path, reduced clearance areas on the I-635 LBJ Express. This solution allowed us to place one girder every 10 minutes. With a lifting speed of 12 feet per minute, we were able to complete a span in a shift.

Our approach to achieving the precise quality required for HSR starts with team orientation where we establish serious expectations for individual quality performance and “right first time delivery.” Step two is rigorous quality control and quality assurance, followed by the verification, validation and self-certification process. Our project quality procedures flow from ISO-compliant corporate procedures used for HSR projects and improved over decades of commitment to continuous improvement. We integrate quality and environmental compliance within our systems management process to provide consistent, predictable results for production, sustainability and protection of the environment.

HSR-INTELLIGENT DESIGN. As the foundation for the future rail and systems, the facilities provided under this contract need to be thoughtfully designed by HSR experts such as the Euroestudios team who have designed 900 miles of HSR for systems in Spain and worldwide. Our designers understand high-speed rail infrastructure requirements and how they differ from light and heavy rail systems. The challenge is to develop an infrastructure envelope that leaves flexibility for the future HSR elements (multiple trainsets, configurations and technologies), respects the HSR requirements (maintains maximum speed) and considers life-cycle costs (for follow-on packages and HSR operation). For example, our structural team understands that trains traveling at high speeds put more strain on structures and their joints due to the impact of vertical loads, dynamic effects, horizontal forces and aerodynamic effects — and our design reflects these considerations.

LOCAL COMMITMENT

The project will serve as an economic stimulant for the Central Valley. Our team includes subcontractor Griffith Company to help us navigate the resources with local expertise and long-standing relationships. As specifically detailed throughout our proposal, we commit to significant local hiring and subcontracting to local firms. In addition, railroad experts JMA Civil (SB/MB) will lead the critical BNSF Railway work elements.

INNOVATION AND ADDED VALUE

Involved during the proposal phase and the development of our alternative technical concepts (ATCs), our HSR experts will be an integral part of our design and construction review process. We offer the Authority innovation and added value including:

- ATCs 2, 11 and 13b along with other enhancements to accelerate construction, reduce cost, mitigate risk and add long-term value
- HSR expertise that translates into thorough understanding of the project and the Authority's design, construction and quality expectations
- Solutions that facilitate co-existence of BNSF Railway, Amtrak and the HSR, both during construction and operation





A. ORGANIZATION AND MANAGEMENT APPROACH

Our approach to project organization and management relies on best practices learned in delivering successful design-build and high-speed rail projects throughout the world. The foundation of the organizational structure, policies and procedures that combine to form our approach is the Ferrovial Agroman system management plan — it is our corporate manual for assuring consistent results across teams, across projects and across countries. The systems management plan will be tailored to this project and includes plans for management of every aspect of the work including quality, environmental, hazardous materials, safety and overall project management and control.

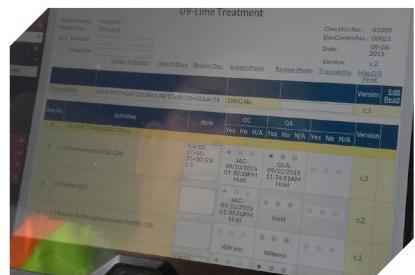
Our management approach recognizes the project constraints (such as delayed environmental decisions and right-of-way parcel acquisitions) and centers on working in partnership with the Authority to deliver a quality project on time. Best practices we will apply to this project include:

- A well-conceived project management plan and management commitments tailored to this project
- Logically segmenting our work and progressing the two segments concurrently (one north of McCombs Road and the other south of it), maximizing efficiency and flexibility for borrowing or reassigning resources to recover or optimize schedule
- A strong, experienced leadership team and co-location, integrating internal staff, the Authority and third parties

SUCCESSFUL PERFORMANCE AND ACCOUNTABILITY

Accountability starts at the top with Project Manager/Director Alvaro Gomez-Muro, who leads our team in offering a balanced integration of design and construction to capture the collaborative benefit of a design-build delivery method and promote quality, constructability, innovation and efficiency. Alvaro has operational decision-making authority and will be the Authority's single point of contact.

As shown in our organizational structure (Figure 1-1 on page 8), Alvaro is supported by key staff and managers who are accountable for their respective teams and key project tasks including environmental, small and disadvantaged business program, quality, design, construction, safety, public communication, project controls and project administration. We are committed to working in collaboration with each other, the Authority and project stakeholders to deliver a project that meets your contract requirements and satisfies the verification, validation and self-certification (V&V) program.



Field Tablets Enhance Timely Communication

We will enhance our web-based document control program (Document Locator by ColumbiaSoft) by using tablets in the field to capture photos and real-time data and upload it for access by the team and the Authority. In addition to constructors, the environmental and quality teams use the tablets to expedite reporting.

COMMITMENT

SUBMITTAL TRACKING SCHEDULE

We know the ability for the Authority to track submittals is important. We will assign activity identification numbers that tie to the submittal numbering in document control, allowing the Authority to directly track the submittal schedule. Monthly look-ahead reports will identify planned submittals for the next three weeks and 90 days. Critical submittals will be identified for priority processing. In the event a submittal is rejected, the revised submittal will be added to the updated schedule to provide tracking dates visible to the whole team, including the Authority.





Successful Strategies

Co-location, along with how we segment our work, will support the development of interdisciplinary innovative solutions at the segment level. This same approach was used on the \$2.1 billion LBJ Express to open the project's major segments three to twelve months ahead of schedule. The approach enhances coordination, promotes communication and streamlines decision-making resulting in expedited resolution of design and constructability challenges.

PROMPT SUBMISSION OF COMPLETE DELIVERABLES. To achieve prompt submission of deliverables that do not require time-consuming revision, we implement strict schedule management combined with a stringent quality assurance/quality control process for all deliverables so they are on time and right the first time. Control-level schedules will track each design package, define all deliverables and link schedule start and finish dates for design status and progress reporting.

To establish a common understanding of the deliverable content and the Authority's expectations, we will kick off design with meetings between our designers, design-build integrators, design quality assurance manager and the Authority. Design segment managers and discipline leads will manage the development of design solutions and submittals. Design Manager Ignacio Navarro, PE, and the design-build integrators will work closely with the designers to verify coordination of all interfaces, incorporation of all requirements and efficient constructability. The production teams will be responsible for independent quality control; our design quality assurance manager will verify compliance with our design quality management plan.

FORMAL COLLABORATIVE PARTNERING PROGRAM. With the Authority, we will create a partnering process that fosters a contractor/owner/stakeholder relationship of a single team based on trust and open communication. We understand that resources invested in building a strong, cohesive team that trusts each other, takes full ownership of all problems and collaborates effectively to implement win-win solutions is a proven strategy for delivering successful projects.

Integrating Environmental, Design and Construction Elements



NORTH TARRANT EXPRESS SEGMENT 3A

Our electronic document management system, enhanced with field tablets, integrates design, construction, environmental and quality teams by ensuring they are all working from the same (and current) documents. The system delivers updated, approved-for-construction documents to field tablets where they are used by the environmental monitoring, inspection and construction teams. The tablets contain quality control and environmental checklists/forms tied to activities on the schedule. GPS-marked photos and data entered on the tablets transfer quickly to designers and office staff. The system enhances meaningful communication between the teams and shortens the decision-cycle for addressing questions and concerns.

LAKE AVENUE GRADE SEPARATION PROJECT

Team member MARRS Services encountered unanticipated contaminated soil on this Southern California grade separation project. The integrated environmental, design and construction team responded quickly to delineate the contaminated area, develop a work-around plan to isolate the contaminated soil and allow clean-up to progress swiftly.





STRATEGIES FOR ACHIEVING PROJECT SUCCESS. We discuss strategies for assuring accountability and successful performance in key areas as follows:

- **Working Safely** – Section 3.C
- **Implementing Quality Programs** – Sections 1.C, 2.D and 3.A
- **Achieving Substantial Completion** – Section 1.B
- **Protecting the Environment** – Sections 2.E and 3.D
- **Managing and Mitigating Risk** – Section 1.E

ENVIRONMENTAL, QUALITY, DESIGN AND CONSTRUCTION INTEGRATION

Our corporate system management plan integrates environmental and quality, resulting in a culture that is focused on sustainability, protection of the environment and quality products. Environmental and quality become the umbrella for delivery of our design and construction services.

TASK FORCE GROUPS. Task force groups for each key technical discipline will provide face-to-face coordination of our work internally and with the Authority, Caltrans, utility companies, railroads and other third parties. Group members include professionals from the design, construction, environmental, maintenance, quality and management teams as well as our design-build integrators, the Authority and third parties. The groups collaborate to develop the approach, value-added features, life-cycle analysis and constructability. They meet regularly to encourage active participation and exchange of ideas with stakeholders, anticipate and resolve issues, and focus on details to ensure compliance with contract requirements. They integrate solutions across all disciplines. Their collaboration and efficient decision-making will be essential to delivering the project requirements and maintaining the project schedule.

EFFECTIVE TEAM INTEGRATION. We will co-locate our key personnel in a central office to facilitate face-to-face communication between our senior management, the Authority, and core staff including design-build integrators, project controls, human resources, procurement, SB/DVBE/DBE/MB compliance, public communication, right-of-way, utility manager and segment managers. The team proximity promotes communication and streamlines decision-making resulting in expedited resolution of design and constructability challenges. Our approach to co-location will also promote successful integration across disciplines. For example, on-site environmental staff will work face-to-face with our design and construction management teams.

EFFECTIVE ORGANIZATIONAL INTEGRATION WITH DESIGN-BUILD

INTEGRATORS. A unique aspect of our approach to design-build, Ferrovial Agroman's technical services group includes more than one hundred engineers with expertise in high-speed rail, civil infrastructure and design-build project delivery. Serving as design-build integrators, these senior engineering professionals drive design and construction by

Task Force Groups

Encouraging real-time, over-the-shoulder, plans-in-hand design discussions and reviews, and to resolve potential issues quickly, our task force groups include:

- Roadway
- Structures
- Railroad
- Drainage
- Utilities
- Geotechnical
- Maintenance of traffic
- Right-of-way

Formed early in the proposal process, our task force groups developed and evaluated ATCs, developed an integrated schedule and project management plan, and completed designs for our construction estimates. We have established working relationships and clearly identified roles and responsibilities, providing a solid foundation for advancing the project.

COMMITMENT

DESIGN SUBMITTAL LAUNCH BRIEFINGS

To expedite reviews on major design submittals, we propose to provide formal submittal launch briefings where we present our design, highlight important features and answer reviewer questions. This meeting helps reviewers better understand our design decisions and provides context for their reviews.





Integrating Subcontractors



SH 130 SEGMENTS 5 AND 6

Our team integrated subcontractors by:

- Dividing the work into smaller design packages to expedite final design/approval resulting in early construction start dates
- Developing smaller construction packages allowing multiple subcontractors to work in various segments of the job and facilitate similar work types to be performed concurrently in all segments
- Using nearly 100 local subcontractors, consultants and suppliers including numerous small and disadvantaged businesses

NORTH TARRANT EXPRESS SEGMENTS 1 AND 2

We conducted a total of 8,000 safety and environmental orientations that were given to subcontractors as well as the firm's own staff. The firm also coordinated the Texas 811 utility locate training for all subcontractors involved in excavation work.

working daily with our designers and constructors to develop innovative solutions that improve quality and efficiency, accelerate the schedule, and reduce cost and risk. A more robust and experienced team than typically offered by contractors has been assigned to this project to participate in the development of our proposal through design and construction, providing maximum continuity and value to the Authority.

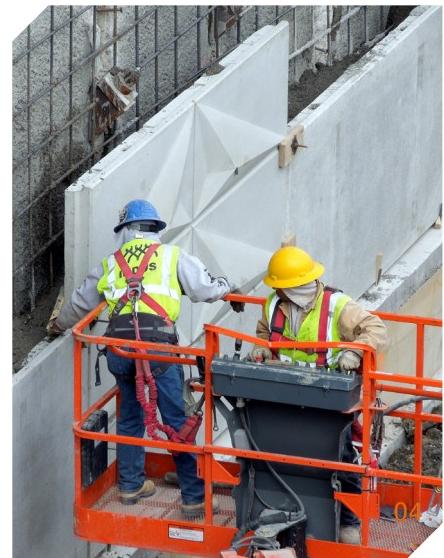
CLEAR AND TIMELY COMMUNICATION. Our approach is to maximize face-to-face meetings or teleconferences when possible, and then document decisions in writing using email or a more formal communication. This preference for conversations facilitates the open dialog and exchange of ideas, optimal delivery of technical solutions and quick resolution of issues. From our organizational philosophy to our execution plan, we use comprehensive interfaces to identify and address concerns and honor contract commitments. Designed to achieve successful performance at all levels, our organizational approach addresses what the Authority values most — accountability in key project tasks, clear and timely communication, team integration and a thorough understanding of risk and risk mitigation.

CONSULTANTS AND SUBCONTRACTORS

Consultant and subcontractor management is a collaborative process. Subcontract administration is led by procurement with input from the appropriate line managers (such as design manager, construction manager or segment managers). Work products and deliverables are managed directly by the line managers. Communication and management tools we use to enhance subcontractor coordination and performance include:

- An electronic document control system providing all firms access to the latest design and documents
- Pre-start ready reviews in the field (or office for design)
- Timely payments to alleviate cash flow concerns
- Weekly progress meetings that include collaborating on the development of accurate schedules for effective forecasting of work
- Quality reviews on subcontractor work production and deliverables
- Project orientation, safety and environmental training

We integrate consultant, subcontractor and supplier activities into our schedule. For schedule recovery or



Indus Construction, LP (DBE) working on I-635 LBJ Express to install soil nail walls.





optimization, we collaborate to assign additional resources, recruit additional firms, re-design to alleviate a constructability issue or re-sequence work if another activity (such as a right-of-way acquisition or a utility relocation) is delaying work.

PROJECT EXAMPLES

Our team offers demonstrated success in management of major infrastructure projects. Examples are provided throughout the text.

1. Key Personnel

The five key personnel identified in our statement of qualifications remain designated for assignment and will be available to commence full-time work upon receipt of notice to proceed.

Skilled Management and Staffing Levels. Our team commits to providing the skilled management personnel and staffing levels necessary to fulfill the contract requirements. Based on our international design-build HSR experience, our staffing plan anticipates a design team of 18 lead engineers and in excess of 40 managers supporting construction during peak periods. Our management team includes senior design and construction professionals with extensive HSR and infrastructure design and construction experience. Highlights include:

- A project manager/director with proven success managing large, complex U.S. design-build projects valued at more than \$2 billion and more than 10 years of experience on HSR projects in Spain
- A design manager and design-build integrators who focus on maximizing the benefits of design-build project delivery
- A quality organization that brings best practices for implementing successful verification, validation and self-certification programs on HSR projects as well as large U.S. design-build construction project experience

2. Organization Chart

Our organization chart (Figure 1-1 on the next page) shows reporting lines for major tasks and departments, and clearly indicates direct reports to each of the five key personnel. In this proposal we adjusted our organization slightly. For example, to underscore the independent nature of our quality program, Quality Manager Matilde Perttierra reports to our executive management board (instead of the project manager/director, as shown in our statement of qualifications). We also expanded our organization chart to show additional managers such as Utility/Third-party Facility Manager Pablo Fernandez and several others.

COMMITMENT

SKILLED MANAGEMENT AND STAFFING LEVELS

Our team commits to providing the named five key personnel and other skilled management personnel and staffing levels necessary to fulfill the contract requirements. Our staffing plan anticipates a design team of 18 lead engineers and up to 40 management professionals supporting construction during peak periods.

Third-party Coordination



I-635 LBJ EXPRESS

Our team worked closely with the owner to shorten the time consumed for aesthetic approval by the cities. We conducted workshops with each city, and combined workshops with all cities. This enabled us to fully understand the requirements and "must haves" for each city, and then use a collaborative process to develop compromises throughout the alignment that facilitated greater aesthetic connection from one jurisdiction to the next. This approach resulted in full approval 90 days sooner than originally scheduled, provided a greater level of aesthetic unity in the corridor and allowed each city to maintain certain personal touches.





Figure 1-1: Team Organization

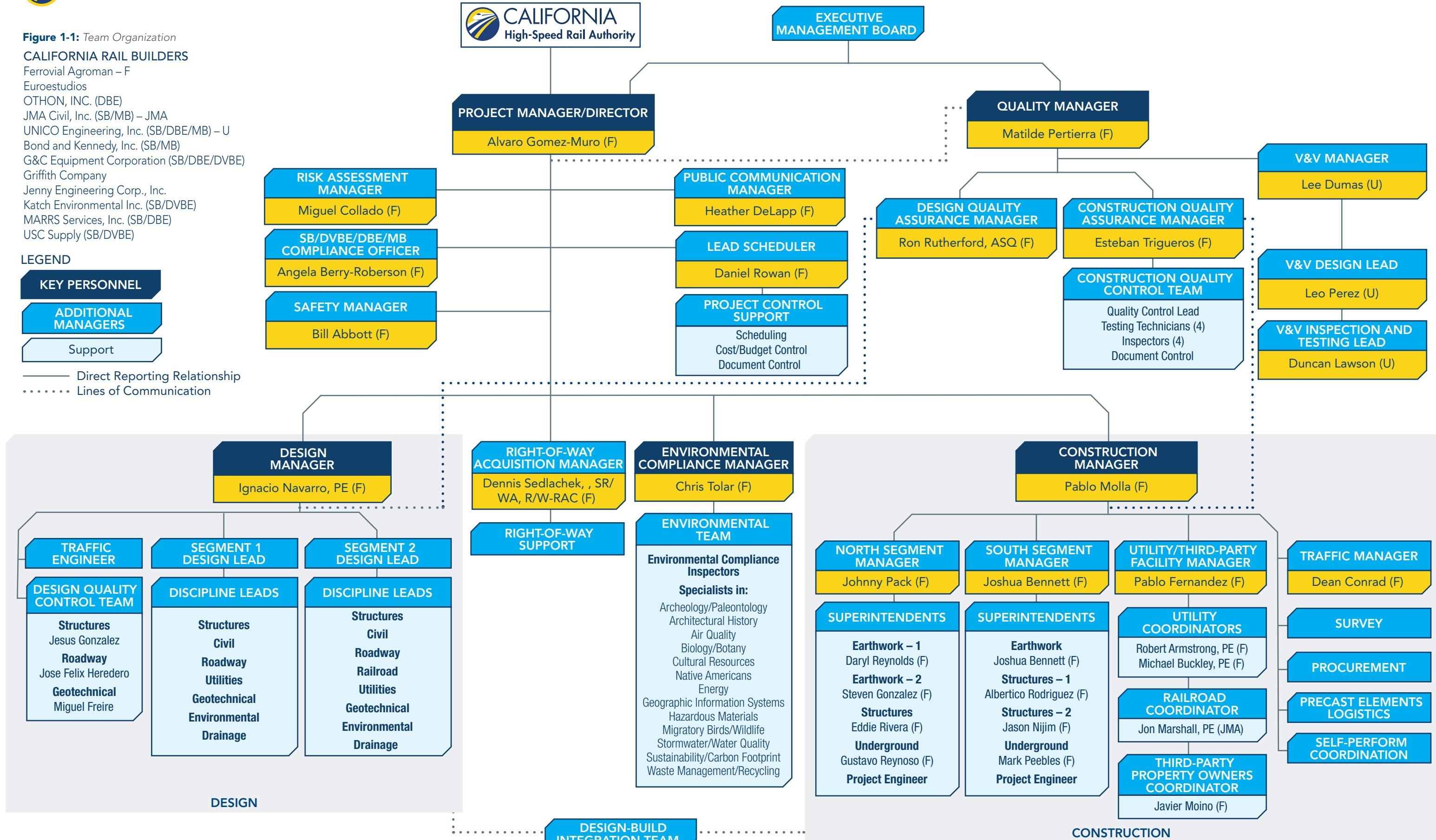
CALIFORNIA RAIL BUILDERS

Ferrovial Agroman – F
Euroestudios
OTHON, INC. (DBE)
JMA Civil, Inc. (SB/MB) – JMA
UNICO Engineering, Inc. (SB/DBE/MB) – U
Bond and Kennedy, Inc. (SB/MB)
G&C Equipment Corporation (SB/DBE/DVBE)
Griffith Company
Jenny Engineering Corp., Inc.
Katch Environmental Inc. (SB/DVBE)
MARRS Services, Inc. (SB/DBE)
USC Supply (SB/DVBE)

LEGEND



— Direct Reporting Relationship
····· Lines of Communication





B. SUBSTANTIAL COMPLETION APPROACH AND COMMITMENT

We proactively manage schedule, control costs and manage risk elements, allowing us to achieve a clear and well-organized approach for successful, on-time project delivery. We constantly seek ways to finish early. This approach is a win-win-win — exceeding the expectations of the public, shortening the duration of construction impacts and helping the Authority reduce its overhead costs. Examples of early completion on design-build mega-projects include:

- **North Tarrant Express Segments 1 and 2** – Nine months early
- **I-635 LBJ Express** – Three months early

COMMITMENT TO MEETING COMPLETION DEADLINES

As shown in Figure 1-3 on page 13), we commit to meeting the substantial completion and final acceptance deadlines.

APPROACH TO ACHIEVING ON-TIME COMPLETION

SCHEDULE DEVELOPMENT. Although we are only at the proposal stage, we created our proposal schedule in significant detail (more than 5,000 activities) with accurate logic ties and activity durations. Seasoned construction veterans, subcontractors, design-build integrators and experienced schedulers worked together to sequence the work and develop productivity rates based on historical data.

After the preliminary schedule development, we worked with our traffic control experts and adjusted our construction sequencing to facilitate maintenance of traffic. We included habitat windows provided by our environmental experts in the sequencing. Our schedule also reflects our commitments to keep BNSF Railway and Amtrak operational. Our designers helped define and prioritize packages and submittal dates. Due to significant utility conflicts, we evaluated utility relocations and prioritized them to mitigate as many critical path impacts as possible.

Finally, we used special software programs including ClaimDigger and Schedule Analyzer Pro to do logic checks, develop histograms and conduct other electronic reviews of the schedule. We conducted a peer review on the schedule using schedulers and construction experts from our other projects and adjusted sequencing, logic ties and productivity rates based on their suggestions. Our project schedule is solid, well-planned and achievable.

TIME CHAINAGE CHART. In conjunction with the required schedule, in Figure 3-6 on page 63, we provide a linear time chainage chart to independently confirm the flow of labor and equipment along the 21-mile project. This analysis is one of the tools used to confirm our ability to manage resources for an on-time completion.

COMMITMENT

ON-TIME COMPLETION

We commit to completion of the project on time. Based on notice to proceed on May 2, 2016, we will achieve substantial completion on April 10, 2019 and final acceptance on June 13, 2019.

Top Five Schedule Considerations

1. **BNSF Railway** – mainline realignment of existing BNSF Railway track (BNSF Railway to self-perform track signal design and construction) and shoofly approvals for ATC 2 requires an active and systematic approach to BNSF Railway coordination
2. **Environmental Re-approvals** – Securing required approvals for ATC 2, 11 and 13b is a top priority
3. **Third Parties** – Expedited completion of any outstanding agreements is critical for fully understanding, designing and implementing project elements
4. **Right-of-way Acquisition** – Phasing design and other preconstruction activities in concert with the earliest to latest property availability dates results in permits complete and work areas shovel ready the day each property is available
5. **Farmers and Growers** – Respecting pollination, growing and harvest seasons (including relocation of irrigation facilities) is a major consideration





INCORPORATING CHANGES INTO OUR SCHEDULE

While we are dedicated to achieving important milestones, we always strive to attain early completions. The project schedule serves as an important tool in this process. Our teams continually evaluate the schedule against actual progress and look for opportunities and work-around solutions. Our approach ensures that events impacting schedule will be rapidly and accurately incorporated into the schedule.

ANTICIPATORY WORK-AROUND SCHEDULES. We continually use our schedule to plan upcoming work and analyze issues that could arise. Work-around schedules that minimize the potential impact of an event, lack of right-of-way access, shortage of materials or other similar items will be created and implemented as quickly as practicable. Typically, these solutions result in a temporary shift in resources from one operation to another.

THIRD-PARTY COORDINATION TOOLS. Our schedule will include activities and sub-activities for coordinating the work with utilities, Caltrans, BNSF Railway, Construction Package 2-3 and other private or public third parties. Including these activities helps establish interdependencies and is a tool for managing each third-party requirement. Our schedule submittals will include a filtered list of these items.

FOUR-WEEK ROLLING SCHEDULES. Communication plays a vital role in planning and coordinating upcoming construction work, especially subcontractor work. A four-week rolling schedule is prepared every week to show work completed last week and a three-week look-ahead. Used in our construction progress meetings, it facilitates planning between managers, superintendents, subcontractors, traffic control and community relations teams, and the Authority.

MATERIAL LEAD TIME AND DELIVERY MONITORING. As described in *Section 3.A.2 – Long-lead Materials*, the production team uses a tracker prepared by the procurement team to monitor receipt of material. When used in conjunction with the four-week schedule, potential material shortages can be identified and resolved before they impact the team's production goals.

WORK BREAKDOWN STRUCTURE. Our work breakdown structure is consistent with and expands upon the contract requirements and considers influencing factors from other stakeholders such as permit approval durations, right-of-way availability and design review approvals. At the highest level, the work is divided into major areas including track structures, civil/sitework and professional services. Subcategories follow the cost account structure provided by the Authority. Under each subcategory, the activities are segregated by alignments A1, L1 and WS1 and phase (design and construction).

We've Done It Before

Reversed Starting Point Eliminated Utility Critical Path Delays

On North Tarrant Express Segments 1 and 2, we managed 396 utility conflicts including several major AT&T fiber optic lines. We used the process shown in Figure 1-2 (next page) to solve a critical path impact from long duration utility relocations. Originally, the schedule contemplated starting with the frontage lanes and moving towards the highway center line. After the schedule optimization workshop, the team flipped the starting point — work began at the center line with the toll lanes and moved outward — providing the utility relocation time required with no impact to the highway construction. In fact, this shift proved so helpful to production, it served as the platform for completion nine months early!





EARNED-VALUE MANAGEMENT. To control cost and schedule, we will use an earned-value management system that integrates schedule, costs, production and percentage of completion. Earned-value management also allows us predict future performance by using historical trends, helping us to initiate preemptive, mid-course corrective actions.

ANALYZING SCHEDULE IMPACTS

Our fast-tracked design approach considers the right-of-way acquisition timeline and accommodates aggressive construction-driven schedules. Our project manager, project controls manager, design manager, design segment managers, construction manager and construction segment managers will meet weekly to evaluate performance against the schedule and develop the four-week rolling schedule (considering input from consultants, subcontractors and suppliers). By monitoring critical path and near-critical path activities and using “what if” schedules to evaluate both potential concerns and schedule opportunities, we routinely achieve early completions. Figure 1-2 illustrates our process for analyzing schedule impacts and conveying schedule information to the Authority.

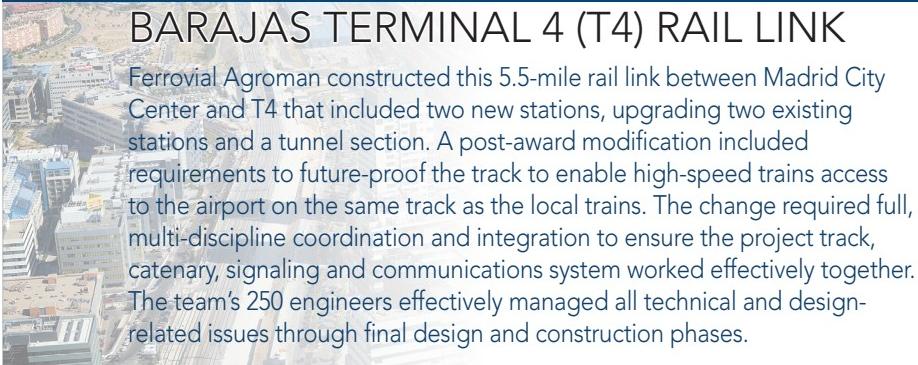
ANTICIPATING AND RESOLVING ISSUES TO MITIGATE SCHEDULE IMPACTS.

The first step is to identify the potential problem; the second is to get the people involved who know the most about it. Typically, issue identification and resolution happens during our regular meetings. However, we will quickly convene task force groups to address urgent issues, create a new task force group for specific problems or escalate issues as needed. Example issues and how we typically identify and resolve them include:

- **Designer Interpretation of Standards or Requirements** – Disagreements or clarifications typically identified and resolved in regular meetings with designers and the Authority
- **Quality Test Result Disagreements** – Discussed and path forward determined in regular quality meetings (Authority in attendance)
- **Traffic Management Set-up** – Resolved by the traffic control task force including designers, constructors, Authority, Caltrans and cities
- **Contractor Interpretation** – Discussed in regular progress meetings with our project manager, construction team and Authority

Responding to Significant – and Late – Scope Change

BARAJAS TERMINAL 4 (T4) RAIL LINK



Ferrovial Agroman constructed this 5.5-mile rail link between Madrid City Center and T4 that included two new stations, upgrading two existing stations and a tunnel section. A post-award modification included requirements to future-proof the track to enable high-speed trains access to the airport on the same track as the local trains. The change required full, multi-discipline coordination and integration to ensure the project track, catenary, signaling and communications system worked effectively together. The team's 250 engineers effectively managed all technical and design-related issues through final design and construction phases.

Figure 1-2: Process for Analyzing Schedule Impacts and Conveying Information to Authority



CONTINUOUS IMPROVEMENT

Mobilizing to Achieve Schedule

We staff from a global workforce of nearly 10,000 and two of our major transportation projects will be demobilizing 650 employees next year. We targeted several of our seasoned project personnel to accompany Alvaro Gomez-Muro to this project beginning at notice to proceed; this team has the skills and proven record to meet the contract completion dates.





Schedule Recovery Success



I-635 LBJ EXPRESS

Shortly after the start of the project, a delay in the acquisition of a parcel on the critical path threatened the project completion date. The team recognized the potential impact immediately, notified the owner (the Texas Department of Transportation) and initiated meetings internally and with the owner to discuss options and potential work-around solutions.

After developing options supported by schedule calculations, the team elevated the issue to the project manager and his Texas Department of Transportation counterpart who negotiated a contract amendment that provided for limited acceleration of an element of work and maintained the original project completion date.

NORTH TARRANT EXPRESS SEGMENTS 1 AND 2

Schedule challenges on this project included a large number of utility relocations, right-of-way acquisitions and maintenance of traffic throughout the project. To respond, the team re-sequenced the work. Rather than constructing the frontage roads first followed by the general purpose lanes and then the managed lanes as planned, they constructed the managed lanes first followed by the general purpose lanes and then the frontage roads. This allowed time for the right-of-way procurement and utility relocations to proceed without delaying construction.

COMMUNICATION OF SCHEDULE ISSUES

We will regularly communicate schedule issues with the Authority. In our regular progress meetings, we will use four-week rolling schedules to discuss the imminent work activities. Monthly updates of the baseline schedule will formally communicate status against planned activities, activity re-sequencing (if any) and other impacts. We will also provide informal communication (telephone or in person) regarding major schedule concerns as we concurrently start our what-if analysis.

PROJECT EXAMPLES

Our record of early completions and on-budget project delivery demonstrates our commitment to proactively identifying issues and resolving them quickly. Lead Scheduler Daniel Rowan will use the same organizational approach and tools for managing this project that he successfully implemented on the I-635 LBJ Express (completed three months early). Additional examples of how our approach to scheduling and project management delivers results are provided throughout the text.

1. Lead Scheduler Qualifications

Project Scheduler Daniel Rowan has 18 years of experience in the development and management of project controls systems and detailed schedules for major construction projects. He is certified in project management and scheduling by the Project Management Institute, and by the AACE International as planning and scheduling professional and earned-value professional.

Daniel has served as project controls manager and senior scheduler on numerous transportation projects including the \$730 million Dallas Area Rapid Transit Orange and Blue Line light rail extension; \$2.1 billion I-635 LBJ Express design-build in Dallas, Texas; \$985 million North Tarrant Express Segment 35W/3A design-build in Fort Worth, Texas, and \$2.7 billion Dallas-Fort Worth International Airport Terminal D Expansion. He and his earned-value tools help “drive” overall production. For example, all I-635 LBJ Express interim milestones for Segments 1A, 1B and 3B were met or exceeded, with Segment 2 opening nine months early and the overall project opening 3.5 months early.

Approach to Implementation of Project Controls. A full-time project controls staff of three (augmented with more at peak construction) will be responsible for developing the critical path schedules, updating progress, generating invoice backups, assisting with change order proposals and performing other similar activities. Responsible for developing and updating the project schedule, Lead Scheduler Daniel Rowan and his team support the project, design and construction managers, and design and field planning teams in scheduling, production analysis and implementation of work, and in development of work-around schedules and/or recovery schedules.





2. Project Schedule

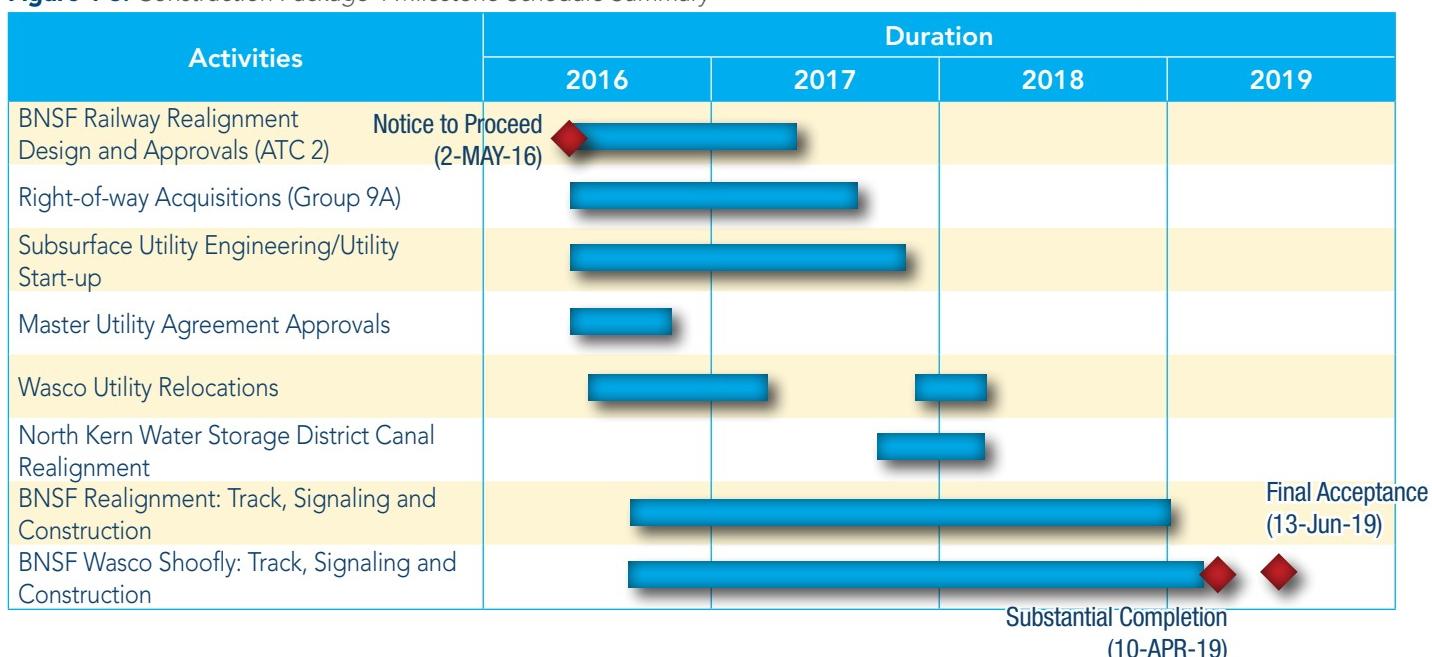
Our proposal schedule, developed using Primavera P6, is included in the *Preliminary Baseline Schedule* binder. It is based on the requirements of the Cost and Scheduling Control Program and delineates our approach to completing the design and construction work by work flow, activity, description, duration, float and logic ties.

Overview of our Critical Path. As shown in Figure 1-3 below, the first critical activities include BNSF Railway relocation approvals, right-of-way parcel acquisition for Group A, third-party agreements and critical path utility relocations. During construction, the Wasco-Shafter utility relocations and the BNSF Railway realignment and shoofly in Wasco form dual critical paths through the first year until completion of the utilities work. Thereafter, the BNSF Railway work comprise the critical items.

BNSF Railway Experts to Manage Critical Path Items. In recognition of the fact that BNSF Railway work is the key to our schedule and on-time completion, we recruited Jon Marshall, PE, from JMA Civil (SB/MB) to serve as our railroad coordinator and lead railroad designer. Jon brings experience working with BNSF Railway, Amtrak, the Authority and the California Public Utilities Commission. He and the JMA Civil team will actively engage BNSF Railway to:

- Coordinate a design that minimizes operational impacts to the railroad
- Secure BNSF Railway approvals
- Coordinate construction in BNSF Railway right-of-way

Figure 1-3: Construction Package 4 Milestone Schedule Summary



Ensuring Successful Performance and Accountability

SH 130 SEGMENTS 5 AND 6

Strategies that facilitated performance on this project included:

- Segmenting the project based on functional and geographical criteria
- Optimizing the design including eliminating one beam per span by using TX-54 type beams
- Performing lime mixing/spreading treatment on site using lime beds to optimize mellowing wait times
- Full-width (40-foot) paving operations that reduced cold joints and backtracking of asphalt crews

I-635 LBJ EXPRESS

Project Scheduler Daniel Rowan and the project manager challenged segment teams to manage their earned value production rates in a friendly competition. As a result, the teams kept their schedule performance index and cost performance index rates near 1.0 throughout the project, delivering segments 1A, 1B, 2 and 3B on time or early.





COMMITMENT

We will use our ISO-compliant environmental and quality management systems that comply with the Federal Transit Administration Quality Assurance and Quality Control Guidelines (FTA-IT-90-5001-02.1).

C. MASTER QUALITY PLAN APPROACH AND COMMITMENT

Quality management and respect for the environment are fundamental to our strategy for delivering this project. We use management systems that meet International Standards ANSI/ISO/ASQ Q9001:2008 (quality) and ISO/ASQ Q14001:2004 (environmental). This approach reflects our team's commitment to perform our activities with the quality required by the Authority, prioritizing environmental protection.

Our company's quality and environmental system manual (*Q&E System Manual*) will work with and ensure compliance with the Authority's HSR program and our project management plan (PMP). Our management approach is described in this set of documents and associated management practices used on many of our successful HSR and design-build transportation projects in the U.S. and around the world.

The PMP, a set of living plans updated to reflect new conditions and continuous improvement, will serve as a reference for our team and the Authority for quality management, policies, procedures, roles, responsibilities and processes. Fully aligned with the elements of the Authority's *Master Quality Plan* (MQP), including the *Verification, Validation, and Self-Certification Procedures*, our PMP will include our quality management plan (QMP).

ALIGNMENT WITH AUTHORITY'S MQP AND VERIFICATION, VALIDATION AND SELF-CERTIFICATION PROCEDURES

We will use our company-established organizational and operational procedures equivalent to those in the Authority's MQP, and integrate them with the project-specific requirements. Figure 1-7 demonstrates the alignment of our PMP with the Authority's MQP.

KEY FEATURES OF OUR APPROACH TO QUALITY

Continual Improvement. As shown in Figure 1-6 on the next page, our corporate culture is one of continual improvement.

Quick Start. Plans that comprise our PMP are already drafted and will be submitted to the Authority before notice to proceed or within 60 days of its issue, both to support Authority's MQP and to expedite design and construction processes. See Figure 1-4 for the PMP outline.

Independent Quality Team. As shown in Figure 1-1 on page 8, independent quality assurance/quality control (QA/QC) for design will be performed by senior engineers who are independent of those producing the documents. Similarly, construction will be verified through independent QA/QC checks by senior personnel who conduct work surveillance, inspection, testing, and auditing per our QMP. A V&V

Figure 1-4: PMP Outline





process independent from our team, our subsidiaries and subcontractors will be used to assess, evaluate and certify design and construction.

STAFFING PLAN

Our quality management team will serve under the leadership of Quality Manager Matilde Perttierra, a senior quality management professional with extensive HSR, transit and design-build experience. She served in quality leadership roles on the HSR Technical Treatment Center Branch Lines in Madrid, the Madrid-Segovia-Valladolid HSR and the Alora-Cartama HSR in Malaga, Spain. She will be supported by V&V Manager Lee Dumas, and our design quality assurance manager and construction quality assurance manager, each with their support teams for V&V and quality.

Matilde Perttierra is a member of our executive team and will be responsible for planning, implementation, reporting and full oversight of our quality program, working in collaboration with Project Manager/Director Alvaro Gomez-Muro, but reporting to our executive management board. We establish this independent reporting relationship to ensure that decisions regarding resolution of any significant quality issues receive the highest attention from our team and that they can be addressed and resolved without undue influence of our production teams. Our anticipated staffing needs for compliance with our QMP and verification and validation requirements of the contract include the full-time equivalents (FTE) shown in Figure 1-5.

EXAMPLES FROM OTHER PROJECTS

Quality management examples from other projects are provided throughout the text.

Figure 1-6: Continual Improvement Process

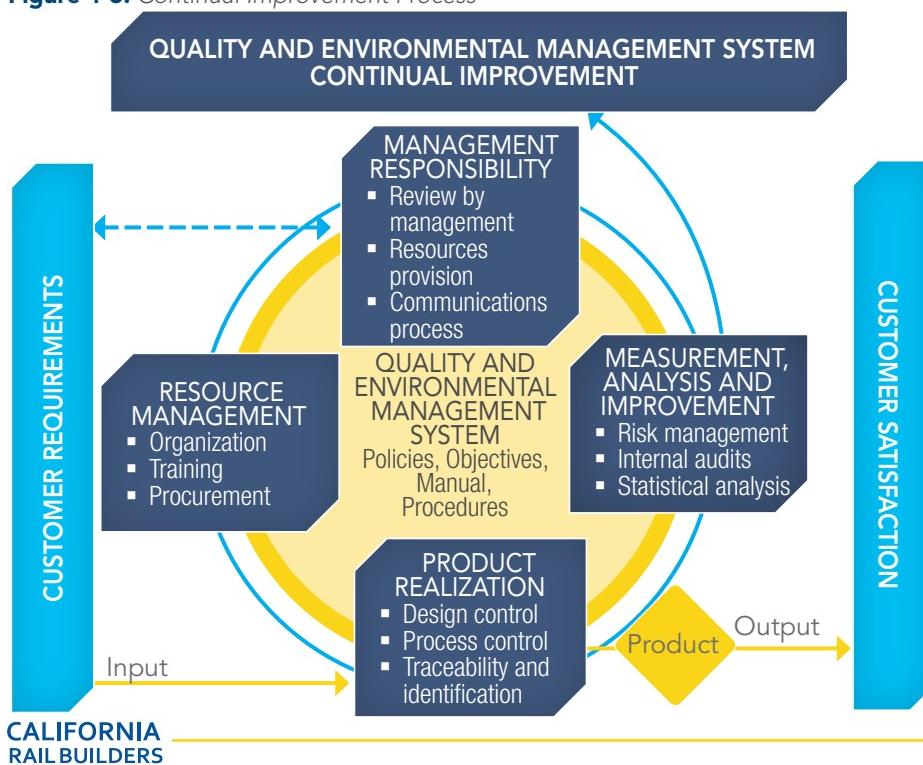


Figure 1-5: Quality Management Team Full-time Personnel

FTEs	Team/Position
1	Quality Manager
QC – Design and Construction	
1	Design Manager
3	Design QC Team
1	Construction Manager
2	Construction Segment Managers
1	Quality Control Lead
4	Construction QC Technicians
4	Construction QC Inspectors
1	Document Control
QA – Design and Construction	
1	Design Quality Assurance Manager (DQAM)
1	Construction Quality Assurance Manager (CQAM)
V&V Team	
1	V&V Manager
1	V&V Design Lead
1	V&V Inspection and Testing Lead
3	V&V staff
26	Total

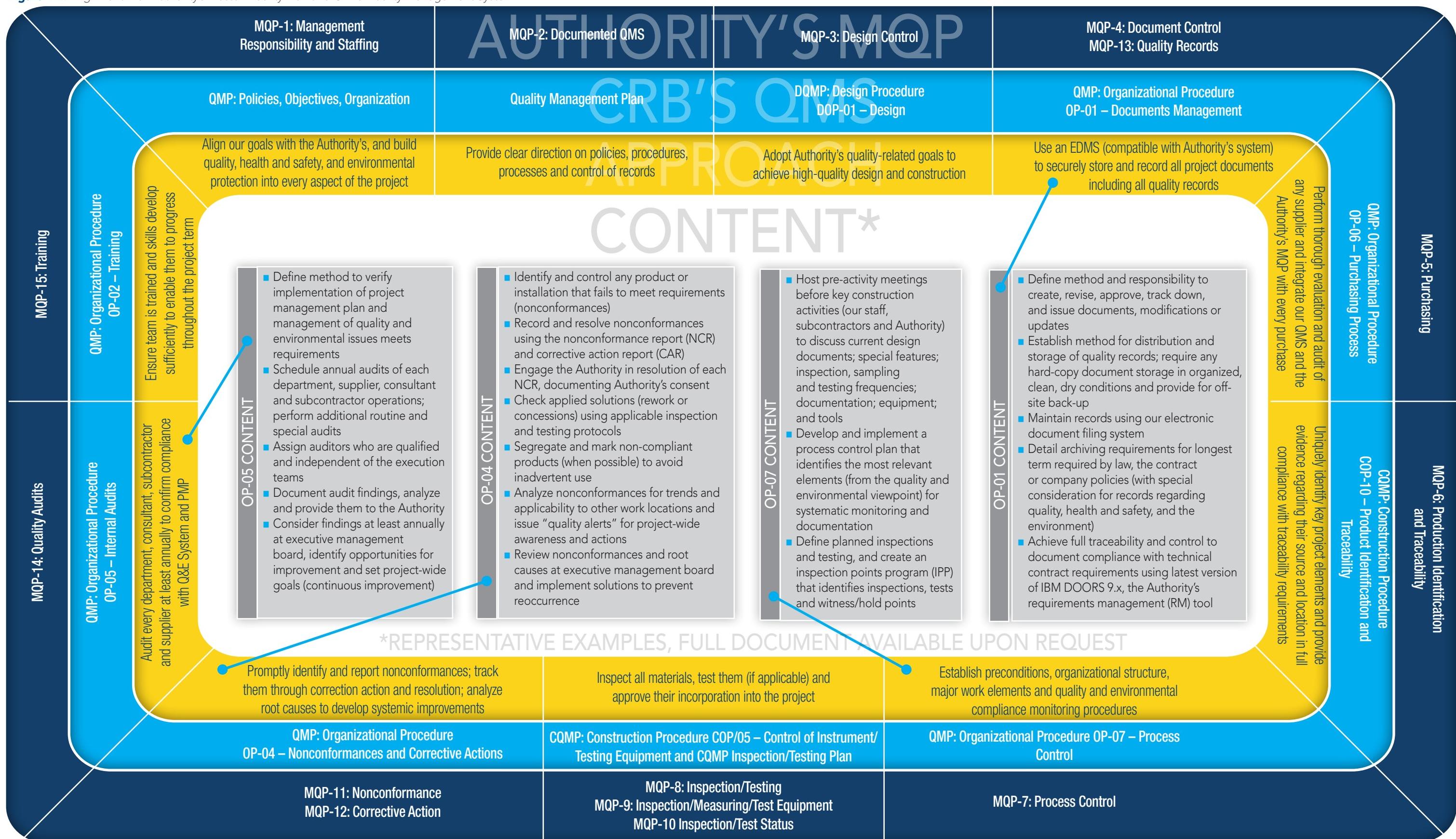
We've Done It Before

For the Levante HSR, Arcas del Villar – Fuentes Section, our ISO-compliant quality management system included verification, validation and self-certification overseen by an independent consultant.





Figure 1-7: Alignment with Authority's Master Quality Plan and CRB's Quality Management System





D. EFFECTIVE COMMUNICATION APPROACH AND COMMITMENTS

Successful public outreach must be consistent, continually adapt to changes in public opinion and be open to input from stakeholder groups. We will collaborate with the Authority to develop a comprehensive public involvement program that informs, educates and engages the stakeholder groups and integrates the Authority's branding (such as #Iwillride). During construction, our communications program will be linked with our maintenance of traffic plans so that pedestrians and drivers will clearly understand where and when to expect sidewalk, road, street and lane closures, and how to navigate them. Public Communications Manager Heather DeLapp will lead the public involvement team and manage day-to-day communications with the public, local agencies and community.

PUBLIC INVOLVEMENT PROGRAM

We will implement our comprehensive PIP that encompasses outreach to stakeholders, elected officials, news media, growers, farmers and other business owners, property owners, the public and other interested parties. Figure 1-8 on page 19 shows our initial steps to launch the program and Figure 1-9 (also on page 19) summarizes our strategies by customer groups. At a minimum, notifications will include those required in the Authority's *Table of Notifications* and will be provided in English and Spanish (or Punjabi, Cambodian, Vietnamese or other languages for targeted outreach).

Business and Residential Impact Mitigation Plan. As part of our PIP, a business and residential impact mitigation plan will include:

- **Outreach** – Inform owners/residents about day-to-day construction progress/disruption via email, social media and flyers/door hangers
- **Access Maps** – Showing pedestrian, customer, delivery, residential and access during construction period
- **Changes to Access** – In writing to businesses and residents at least two weeks prior to start of construction
- **Garbage and Recycling Removal** – Access information
- **Construction Kiosks** – Signage at each intersection that lists all businesses affected by construction and whether they are open

Crisis Communication Plan. Our crisis communication plan will include employee training, information distribution, coordination with the Authority and emergency services, and brainstorming exercises.

Heather DeLapp will be responsible for informing the Authority and the appropriate stakeholders and customer groups in an emergency event.

Communication to Authority. Weekly reports will capture public contacts and our responses for preceding week, including any trends. Heather DeLapp will meet weekly with the Authority to discuss upcoming construction activities and planned communications outreach.

COMMITMENT

In coordination with the Authority, we will implement a boots-on-the-ground communication strategy that engages stakeholders and the public and integrates the Authority's branding (such as #Iwillride).

"When you have a project of this magnitude, boots-on-the-ground communication and engagement are absolutely critical."

— Heather DeLapp

Effective Public Communications



I-635 LBJ EXPRESS

On our I-635 LBJ Express project, Heather DeLapp organized and implemented a boots-on-the-ground approach to meeting businesses along the corridor, providing contact information and gathering their information. We compiled a database by area for location-specific email alerts such as notices about garbage pickup, access and parking.

NORTH TARRANT EXPRESS SEGMENTS 1 AND 2

In 2015, the project took top honors from the AASHTO in the special event category for the outstanding ribbon cutting event held when the project opened nine months early.





Website, Texts, Social Media, Quick Maps and Apps

We will establish a project website and social media accounts that provide motorists with current travel and road closure information. In addition to the kiosks listing open/closed status of businesses on streets impacted by construction, we will include information for businesses impacted by construction on the project website.



An example of our targeted construction outreach campaigns, the "Orange Cones No Phones" campaign used during construction of North Tarrant Express Segments 1 and 2 and I-635 LBJ Express included multi-media expression including this excerpt from a powerpoint presentation used to update the public on project status.

We've Done It Before

On the I-635 LBJ Express and North Tarrant Express Segments 1 and 2 we arranged tours for elected officials, congressional delegations, and media. They typically included a brief presentation followed by on-site visits coordinated with our safety team.

Task Force Meetings with Stakeholders. Regular task force meetings provide an opportunity to communicate routine construction updates and identify issues from impacted residents, growers, farmers and other businesses so we can be good community partners.

Outreach. Our team will conduct bid-item specific outreach meetings for SB/DBE/DVBE/MB firms led by Angela Berry-Roberson as discussed in *Section 4 – Small Business Participation*.

Visitor's Center. We will establish a visitor's center in Wasco. The center will provide project and general HSR information; upcoming work including changes to traffic closures and detours; scheduled utility shut-downs for utility relocation work (gas, water, electric); demolition and other remediation; accident information; special events calendar and information; and project completion status.

Construction Tours. We will develop a tour protocol that identifies the types and timing of tours. We will participate upon request.

1. Public Communications Manager Qualifications

With 14 years of community relations and stakeholder outreach experience, Heather DeLapp develops creative, dynamic and results-oriented programs for large, politically sensitive complex infrastructure projects that included projects with the U.S. Air Force. Heather works closely with owner public relations organizations to develop strong, cohesive messaging, and strong relationships with community and stakeholder leadership. She recently served as the public relations manager for the \$2.1 billion I-635 LBJ Express project in Dallas, Texas, where she managed the public information programs including media relations, community relations, construction information and crisis communications for this high-profile, politically sensitive project.

Role and Responsibilities. Heather DeLapp reports directly to Project Manager/Director Alvaro Gomez-Muro and will be a member of the executive team. She is responsible for day-to-day public involvement and mitigating the impact of construction for businesses and residents in the project area. She will be assigned full-time to the project and will be 100 percent dedicated to the leadership and management of the public involvement team.

2. Public Involvement Staffing Levels

Heather will be supported by a local public relations firm and an internal team of up to three qualified public involvement representatives (at peak of construction) who have all the required years of experience, certifications and trainings. Their qualifications will be submitted to the Authority for review and approval 30 days prior to field work taking place.



**Figure 1-8:** Launching the Public Involvement Program**Figure 1-9:** Summary of Communication Outreach Strategies

Group	Goal	Communications Methods	Content
Public (including growers, farmers and other business owners, nearby residents, commuters, Amtrak passengers, neighborhood associations, community groups, special interest groups and potential users)	Building rapport and overwhelming support for the project and thoroughly understanding their needs, requirements and preferences	<ul style="list-style-type: none">■ Public meetings and speakers bureau■ Business owner technical working group■ Project website■ Videos■ Newsletters■ Email/text message alert service■ Quick maps■ Door hangers■ Media – tv, radio, print, internet■ Dynamic message signs■ Open house and meetings with community leaders■ Twitter, Facebook, mobile phone applications and other social media■ Support from local public relations firm■ 24/7 hotlines	<ul style="list-style-type: none">■ Project overview information■ Informational brochures and marketing pieces■ Schedule of street and ramp closures and alternate routes■ Special event information (shuttles, alternative routes)■ Questions/answers, contact information
Local, state and federal government entities	Active support for the project and cooperation in achieving implementation	<ul style="list-style-type: none">■ Project meetings and technical working groups■ Elected official briefings■ Written status and briefing reports■ Project tours	<ul style="list-style-type: none">■ Project overview information■ Questions/answers, contact information
BNSF Railway, Amtrak and special event planners (such as for the Wasco Rose Festival)	Active support for the project and strategies for supporting their needs	<ul style="list-style-type: none">■ Meetings and task force groups■ Special-purpose brochures and traffic alternatives documents including information for pedestrians leaving Amtrak trains	<ul style="list-style-type: none">■ Project overview information■ Informational brochures and marketing pieces■ Special event information (shuttles, alternative routes)■ Questions/answers, contact information
SB/DVBE/DBE/MB firms, subcontractors and suppliers	Maximizing opportunities and participation of local firms and meeting the small and disadvantaged business goals	<ul style="list-style-type: none">■ Outreach meetings, networking■ Heavy civil training program developed with local industry and association groups (like Associated General Contractors)■ Project website link to "Doing Business"■ Registrations and email	<ul style="list-style-type: none">■ Potential contract opportunities■ Introductions to major subcontractors, bonding, banking, certification and others■ Training
Media	Media relations during all phases of the project	<ul style="list-style-type: none">■ Dynamic message signs■ Advisories to local radio and news stations■ Social media messaging (Facebook/Twitter)■ Email/text message alerts	<ul style="list-style-type: none">■ Incident and impacts to travel■ Constant traffic report updates■ "All clear" messages
Environmental	Compliance with comprehensive environmental protection program	<ul style="list-style-type: none">■ Open house and public meetings■ Newsletters■ Other methods similar to those used for the public	<ul style="list-style-type: none">■ Names and contact information (24/7)■ Preferred methods of routine and emergency contact distribution





E. RISK REGISTER

COMMITMENT

RISK MANAGEMENT

We will hold monthly risk management meetings, issue a monthly risk report and issue an updated risk register to our team, the Authority, and major third parties.

ATCs Reduce Risk

Our ATCs significantly reduce public risk by:

- Reducing impacts to third-party infrastructure
- Providing grade separations that were not part of the 15 percent design
- Minimizing environmental impacts during construction from reduced materials hauling
- Reducing falsework erection, minimizing construction on falsework and not adding traffic/falsework interfaces

Our approach to risk assessment and management is implemented as established in our company-wide risk management system. Throughout the pre-bid phase, we assembled task force groups comprised of design, construction and HSR experts to identify risks throughout the alignment and begin developing mitigation strategies. We worked closely with the Authority in the one-on-one meetings and with many third parties to gain invaluable information to understand the key risks.

ATCs REDUCE RISK. Our ATCs significantly reduce public risk by reducing impacts to third-party infrastructure, providing grade separations that were not part of the 15 percent design, minimizing environmental impacts during construction from reduced materials hauling, reducing falsework, minimizing construction on falsework and not adding traffic/falsework interfaces. During long-term operations we acknowledge that there are some risks that are added, such as maintenance of the two new stormwater pump stations; however, we believe that the value of the removal of the at-grade crossings through Wasco greatly exceeds the minor operations and maintenance risk the pump stations add.

How We Assess, Mitigate and Manage Risks. In our formal approach to risk identification (shown in Figure 1-10), a multi-discipline team starts with a brainstorming session to identify potential risks and their probability. We define preventive, mitigation and corrective actions for causes and consequences, and assign a risk sponsor under the overall stewardship of our Risk Manager Miguel Collado. The risk sponsor is an individual who is in a position to own, mitigate, manage and control the risk. We update the risk register as circumstances change. The Authority and key third-party stakeholders will be invited to participate in our monthly risk management meetings.

TOP 20 RISKS. Figure 1-11 on the next two pages includes the 20 most significant risks to the project's schedule, budget or quality. The risk register provides risks descriptions, probability, mitigation strategies (to eliminate or reduce likelihood of occurrence) and corrective measures (to reduce the impact if the risk occurs).

Figure 1-10: Risk Management Process





Figure 1-11: Matrix of Top 20 Risks, Probability and Mitigation/Management Measures

*Probability of occurrence= before mitigation/[after mitigation]

	Challenge/Risk	Probability*	Mitigation (Eliminate/Reduce Likelihood)	Management (Reduce Impact if Risk Occurs)
1	Environmental Re-examination for ATCs – Changes to approved alternative right-of-way and moving viaduct to an at-grade embankment (ATC 2); raised HSR alignment (ATC 11); and shift in HSR alignment (ATC 13b) trigger re-examination for transportation, aesthetics, air quality, noise and vibration	High [High]	<ul style="list-style-type: none">■ Re-run the models for air and noise and vibration■ Assess impact of change in right-of-way■ Establish a sound basis for ATC beneficial effects and gain impacted stakeholder support■ Evaluate viability of a negative declaration strategy■ Seek necessary approval under the Authority's variation process	<ul style="list-style-type: none">■ Incorporate re-examination into schedule■ Expedite document development■ Coordinate closely with the Authority, approving agencies and impacted stakeholders (SemiTropic Water Storage District - ATC 13b; City of Wasco, Caltrans, BNSF Railway and Amtrak - ATC 2; and Kern County - ATC 11)
2	Insufficient BNSF Railway Track Allocation Time – Failure to obtain sufficient work windows with BNSF Railway's active track schedule	High [High]	<ul style="list-style-type: none">■ Incorporate BNSF Railway design reviews and approvals into our schedule■ Immediately engage BNSF Railway in task force and coordination meetings■ Assign single point of contact for coordination, approvals and notification	<ul style="list-style-type: none">■ Active management of schedule and biweekly coordination meetings with BNSF Railway■ Weekly design meetings with construction, project controls and management teams■ Early partnering with BNSF Railway and all affected parties
3	Labor Availability – Insufficient skilled labor to conduct portions of work at time/productivity contemplated by our schedule	High [Medium]	<ul style="list-style-type: none">■ Use means/methods that are less labor-intensive (viaduct construction)■ Identify labor requirements well in advance of work using resource-loaded schedule■ Coordinate with local unions, associations and firms to recruit and train workers■ Remobilize workers from other parts of state and country■ Establish training programs focused on targeted workers	<ul style="list-style-type: none">■ Monitor and accelerate training, recruiting or remobilization activities to meet demand■ Develop work-around solutions such as re-sequencing or rescheduling work■ Consider alternative means and methods■ Access resources of dedicated subcontractors with multiple California offices and crews experienced at viaduct construction
4	Incorporating Betterments from Utility Owners – Requests from several utility owners to upgrade old utilities rather than protect in place	High [Medium]	<ul style="list-style-type: none">■ Review with each utility owner the standards, codes and specifications required for relocated utilities■ Confirm the design standards with the Authority, and possibly each utility, on the design criteria for each existing utility when a utility line must be protected in its current location	<ul style="list-style-type: none">■ Identify payment source for any upgraded utilities/betterments prior to installation and document in formal agreements (in coordination with Authority)
5	Delay in Third-party/Stakeholder Approvals – Failure to receive timely approvals from BNSF Railway, Wasco, SunnyGem, Semitropic Water Storage District, Kern County, Tulare County, Caltrans, Amtrak, Certis	High [Medium]	<ul style="list-style-type: none">■ Establish coordinated segment design that balances resources and considers special conditions/stakeholders■ Expedite master agreements that establish roles and expectations■ Include stakeholders in task work groups and formal partnering sessions■ Assign third-party coordinators to each entity to focus on relationships and integration	<ul style="list-style-type: none">■ Use regular task force meetings to stay ahead of issues that could impact approvals■ Concurrently coordinate technical requirements while agreements are finalized■ Actively manage and distribution of schedule to keep Authority and stakeholders aware of potential impacts■ Escalation of issues for Authority assistance where beneficial
6	Unknown Hazardous Materials – Lead/asbestos in unknown locations (in addition to known building locations)	High [Medium]	<ul style="list-style-type: none">■ Expand hazardous materials survey conducted during the proposal phase to include interior investigation of buildings to be demolished and identification of other possible hazardous materials sites■ Establish approved hazardous waste disposal plan including ready disposal site■ Train personnel in identification and handling of hazardous materials	<ul style="list-style-type: none">■ Follow protocols and procedures for hazardous materials identification, handling, storage, removal and transportation■ Notify Authority (and other agencies as applicable) upon discovery of new sites
7	Geotechnical Conditions Risk – Level of analysis at preliminary design stage may not be able to capture the potential behavior of various structures under different soils and loading conditions (embedded structural elements at preliminary design stage are very idealized)	High [Medium]	<ul style="list-style-type: none">■ Expand on geotechnical investigations during proposal development■ Research data (including obtaining California Geological Survey quadrangle maps, Alquist Priolo maps and groundwater monitoring wells) and study area flood maps■ Conduct geotechnical investigations (conventional drilling including standard penetration test, cone penetration and pore water dissipation tests) and laboratory tests for soil index classification, strength (direct shear or tri-axial) and cyclic direct shear■ Identify extent of unsuitable soils within the track footprint and estimate suitable pile depths and ground improvement required to minimize effects of liquefaction■ Implement detailed seismic design and analysis plan for earthquakes and liquefaction	<ul style="list-style-type: none">■ Monitor groundwater table during construction and minimize and, if possible, avoid the impact on groundwater table during construction■ Minimize impacts to existing surface water; leave interconnections between bodies of water intact■ Evaluate and minimize subsidence issues■ Use suitable fill materials and following best practices for placement and compaction■ Evaluate response of the complete system model and soil structure interactions to consider performance under complex loading conditions including seismic loads
8	Borrow Material – Embankment fill material source not available or costly; environmental impacts associated with buying, permitting and transporting fill material	High [Low]	<ul style="list-style-type: none">■ Significantly reduce amount of embankment fill needed with ATCs■ Prioritize and expedite borrow material approvals	<ul style="list-style-type: none">■ Identify alternate borrow sources and evaluate cost/schedule impacts for options■ Supplement local trucking resources with equipment from outside the local area
9	Complying with Environmental Requirements – Delay in obtaining timely approvals and permits or stop work as a result of non-compliance	High [Low]	<ul style="list-style-type: none">■ Merge award-winning Ferrovial Agroman sustainability practices with Griffith and subcontractor practices to capture and implement overall best practices and lessons learned including environmental compliance plan based on ISO 14001:2008■ Assign expert environmental compliance team to develop, monitor and report on compliance, mitigation and commitments■ Create environmental commitments database, compliance matrix and line list	<ul style="list-style-type: none">■ Monitor compliance, develop reports and trends; revise approach and plans when required■ Conduct training and re-training■ Conduct additional stormwater pollution prevention plan compliance checks in advance of storm predictions
10	Utility Relocations Delay – Critical path relocations of utilities, especially those in Wasco and within BNSF Railway right-of-way	High [Low]	<ul style="list-style-type: none">■ Develop schedule with utility critical paths to prioritize relocations that are determined critical infrastructure (such as water and power); prioritize right-of-way acquisitions with the Authority■ Conduct site investigations, document review and potholing to fully understand utility locations; hand dig around known utilities	<ul style="list-style-type: none">■ Install temporary services■ Supplement utility agency self-performed work with CRB resources■ Follow established protocols for notification and resolution of any accidental service disruptions





Figure 1-11: Matrix of Top 20 Risks, Probability and Mitigation/Management Measures (continued)

*Probability of occurrence= before mitigation/[after mitigation]

Challenge/Risk	Probability*	Mitigation (Eliminate/Reduce Likelihood)	Management (Reduce Impact if Risk Occurs)
11 BNSF Railway Signal and Track Self-performed Work Delay – Work is critical path)	High [Medium]	<ul style="list-style-type: none">■ Actively engage BNSF Railway in configuration/schedule discussions immediately after notice to proceed■ Assign railroad coordinator Jon Marshall, PE (JMA Civil), who is known to BNSF Railway■ Fully understand BNSF Railway operations to develop solutions that support their requirements	<ul style="list-style-type: none">■ Because any increase in construction schedule for BNSF Railway will have a direct impact on completion of project, supplement BNSF Railway crews with CRB team members if needed■ Monitor and communicate short- and long-term schedule forecasts and develop options, if possible
12 Impacting BNSF Railway Operations and SR 43 Traffic – Unacceptable disruptions to operations BNSF Railway and SR 43 operations	High [Low]	<ul style="list-style-type: none">■ Design precast beams where possible (with decks when bridges cross over a road or a railroad where possible) to optimize schedule and minimize impacts■ Obtain BNSF Railway executed agreement and easement documentation between utility owners and BNSF Railway for locations where the BNSF Railway track will be relocated	<ul style="list-style-type: none">■ Establish consistent coordination with full-time third-party coordinators■ Provide timely and accurate information about construction impacts, closures, detours and other impacts (including media releases for highway traffic impacts)■ Coordinate any changes in schedule immediately
13 Sustainability – Difficulty meeting sustainability goals	High [Low]	<ul style="list-style-type: none">■ Implement program based on Ferrovial Agroman's award-winning sustainability practices■ Quantify in advance the waste to be diverted and identify recycled material sources/depositories■ Verify clean equipment and non-potable water sources for use	<ul style="list-style-type: none">■ Monitor activities and make mid-course corrections if required to optimize sustainability and recycling
14 Accommodating High-speed Rail – Design for high-speed rail requires additional considerations that most U.S. designers have not encountered	High [Low]	<ul style="list-style-type: none">■ Use Euroestudios — high-speed rail design experts — to lead design of high-speed rail elements■ Apply lessons learned/best practices from worldwide high-speed rail design-build projects■ Integrate track expert input into design■ Implement design quality control/assurance to ensure compliance with all contract requirements, including high-speed rail design criteria	<ul style="list-style-type: none">■ Evaluate multiple construction means/methods for structures including segmental span-by-span method for improved safety and reduced environmental impacts■ Minimize number of joints in viaduct designs and place joints where they can be maintained without impact to trains/traffic■ Evaluate water crossing options considering site-specific issues, life-cycle costs and constructability■ Establish access-controlled at-grade crossings including wildlife crossing features
15 Right-of-way Acquisition Delays – Parcel access unavailable on date needed to start field work	High [Low]	<ul style="list-style-type: none">■ Prioritize work based on right-of-way acquisitions schedule■ Integrate right-of-way schedule into project critical path schedule■ Re-evaluate right-of-way priorities with Authority upon award	<ul style="list-style-type: none">■ Develop work-around solutions such as rescheduling or resequencing work■ Elevate concerns when work-around solutions threaten to fall short of schedule maintenance
16 Ineffective Traffic Management – Unacceptable impacts to traveling public or unsafe conditions for construction team	High [Low]	<ul style="list-style-type: none">■ Develop traffic management plans using task force teams with both design and construction professionals participating to identify and resolve potential community impacts■ Determine construction transportation plan that address routing and delivery schedules■ Provide timely, accurate traffic information during construction	<ul style="list-style-type: none">■ Continuously monitor traffic control measures, reset them when necessary■ Adjust plan as required
17 Achieving SBE/DBE/DVBE/MB Goals – Difficulty in recruiting hundreds of qualified SBE/DBE/DVBE/MB firms to meet goals	High [Low]	<ul style="list-style-type: none">■ Build on proven track record of SB/DBE utilization from other projects and create sample plan to confirm sufficient capacity available to achieve compliance■ Continue local outreach program started (1,200 firms in the Authority's database)■ Identify work that can be done by SBE firms; perform research and outreach to ensure firms ready and able to perform work and implement other strategies discussed in Section 4 of this proposal■ Draft scopes of work sized for small firms, unbundling or repackaging work to encourage bidding	<ul style="list-style-type: none">■ Track SB/DBE/DVBE/MB use at all levels of the project including second- and third-tier participation■ Monitor compliance regularly and implement a specific recovery plan if required■ Offer flexible bonding and retainage programs and assistance securing equipment, materials and labor■ Create training and mentoring opportunities
18 Community Benefits Agreement Compliance – Recruiting sufficient qualified crafts workers to comply with the Community Benefits Agreement	High [Low]	<ul style="list-style-type: none">■ Designate a labor relations officer as single point of contact with unions and the Authority's Jobs Coordinator■ Pre-identify jurisdictional assignments and require subcontractors to do so; make them clear to local unions well in advance of work so that any disputes can be resolved before work begins■ Educate subcontractors (including lower-tier subcontractors) on requirements; provide contact information and a liaison for them to meet and develop relationships with local labor unions; collect letters of assent before start of all work■ Communicate local labor practices to out-of-area contractors prior to performing work	<ul style="list-style-type: none">■ Establish project website, media program, social media program■ Create manpower plan showing how many National Targeted Worker/Disadvantaged Workers will be needed in each scope■ Create procedures for contractors of all tiers to pre-identify workers that qualify■ Regularly track/distribute reports showing targeted worker compliance■ Require subcontractors that are falling short to submit and follow recovery plans■ Consider labor from all unions signatory to agreement including those not located in area
19 Farmers/Growers Impacts – Unacceptable impacts to farmers and growers including irrigation and pollination, growing and harvest seasons	High [Low]	<ul style="list-style-type: none">■ Establish third-party coordinator to conduct listening sessions with all properties impacted■ Provide irrigation for both sides of fields bisected by alignment■ Coordinate mitigation of dust and vibration impacts, being especially sensitive to bee pollination of almond trees■ Schedule utilities relocations for off-season work (consider farmers and local irrigations district requirements to minimize impacts to growing/harvest activities)	<ul style="list-style-type: none">■ Establish hotline available 24/7 for complaints and concerns and seek prompt resolution■ Use regular outreach and other meetings to stay ahead of issues that could impact construction
20 Insufficient As-built Information – Unknown field conditions and potential for field discoveries during construction (utilities, City of Wasco, geotechnical)	High [Low]	<ul style="list-style-type: none">■ Conduct due diligence, ask agencies for additional information and proceed with design according to industry standards■ Conduct additional potholing for systems in conflict	<ul style="list-style-type: none">■ If unknown items discovered, immediately secure area for safety and potential property/environmental damage and follow established protocols for management and notification of Authority and others



SECTION 2 |
**DESIGN AND
DESIGN OVERSIGHT**



**CALIFORNIA
HIGH-SPEED RAIL PROJECT**

Design-Build Contract for
CONSTRUCTION PACKAGE 4

Proposal | RFP Number: HSR 14-32





TECHNICAL PROPOSAL

2. Design and Design Oversight

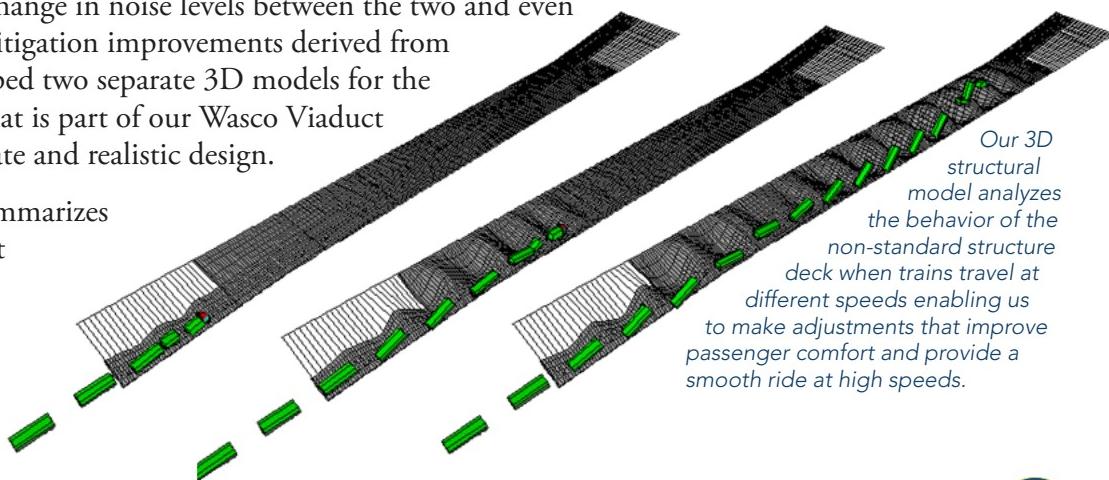
Our team developed a thorough understanding of Construction Package 4 and created alternative technical concepts (ATC) and other design solutions that provide added value to the project for the Authority, the local community, the project's stakeholders and the traveling public. Our design helps balance the earthwork, minimizes impacts to adjacent facilities and reduces utility impacts. Advanced studies and investigations we performed enabled us to reduce environmental impacts, maximize mobility across the alignment (both during and after construction) and improve ride quality for HSR users.

For example, we conducted a detailed noise study, including a 3D model, that compared the original design to our ATC 2 solution. The results indicated no significant change in noise levels between the two and even identified several noise mitigation improvements derived from the ATC. We also developed two separate 3D models for the non-standard structure that is part of our Wasco Viaduct resulting in a more accurate and realistic design.

Figure 2-1 on page 25 summarizes features of our design that exceed the requirements, or provide improvements or optimizations.

COMMITMENT

We will provide a quality design that fully supports the special requirements of HSR and the contract, meets or exceeds the expectations of the Authority and the project stakeholders, and considers local business input.





COMMITMENT

We will begin mobilization of our design team upon notice of award so they are ready to start work at issue of notice to proceed.

A. DESIGN COMMENCEMENT

Our lead designers will move to our on-site project office immediately following notice to proceed. Procurement managers will be included in task force meetings to identify and begin the process of procuring resources for work that will begin first.

Due to the amount of field work that may be accomplished prior to full completion of design, our schedule relies upon a fast-track design approach. Within each of the two segments, completion of the design is subdivided into utility relocation packages, a demolition and grading package, a foundation-only package and balance of structures packages.

Phasing the design packages enables us to start early construction activities in the field. A site demolition, clearing, utilities and civil work package will enable the site to be prepared early for the track structure work. Next is a foundations-only package. The remaining final structural design (piers and cast-in-place concrete box girders) will follow in a final design package.

RAPID MOBILIZATION

A rapid mobilization of design staff is critical to getting the early design packages out and meeting the overall schedule. The same team of engineers who have been developing the design for this proposal will advance the design after award, building on the work we have already started.

Our key managers and design leads will be mobilized immediately focusing on early action items — such as additional geotechnical investigations and hydrology studies, environmental and site surveys, Level B subsurface utility engineering, utility and railroad coordination and work related to the environmental re-examination process — to refine the design and progress the Design Baseline Report. They will be supported by more than a dozen engineers within 30 days and design staffing will peak in the first 180 days after notice to proceed.

MADRID – EXTREMADURA HSR, MERIDA – BADAJOZ SECTION

Euroestudios led the preliminary and final design of this \$270 million, double-track, 22-mile-long segment linking Portugal with Spain. The design team immediately mobilized 15 engineers at notice to proceed and ramped up to 36 engineers within the first 60 days. The off-site-based engineers made bi-weekly visits to the site in Portugal at the peak of construction to expedite resolution of design and constructability challenges.



Mobilizing Design Staff

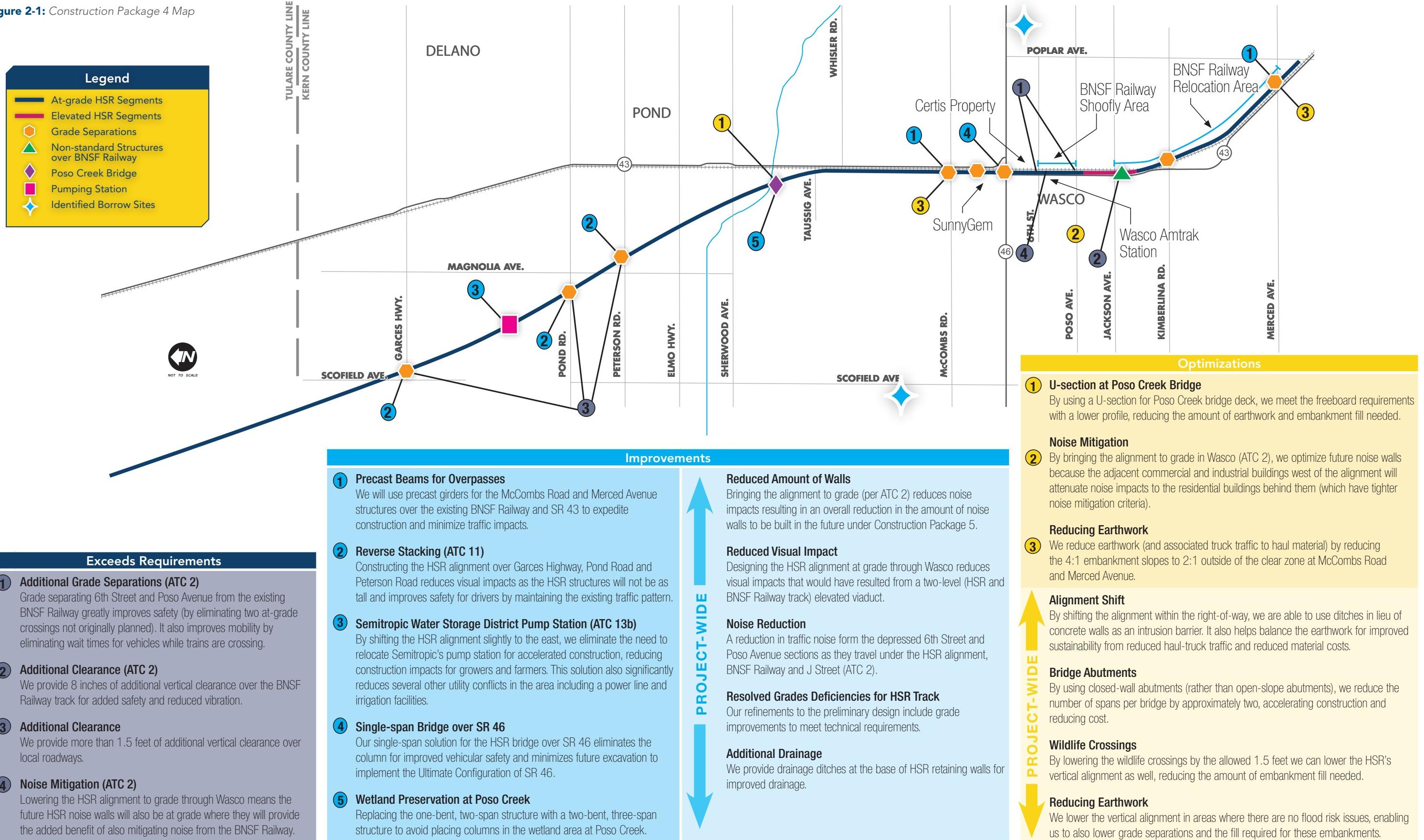
Key activities we have performed that will jump-start work after notice to proceed include:

- Utility surveys and preliminary relocation designs
- Geotechnical work to determine suitability of borrow material
- Environmental, archaeological, architectural and biological field surveys including advanced noise studies for our ATCs
- Meeting with utility owners and other third parties including the City of Wasco, Semitropic Water Storage District, North Kern Water District, Kern County and Caltrans
- Development of the BNSF Railway shoofly design for our ATC 2 solution that brings the HSR alignment to grade through Wasco





Figure 2-1: Construction Package 4 Map



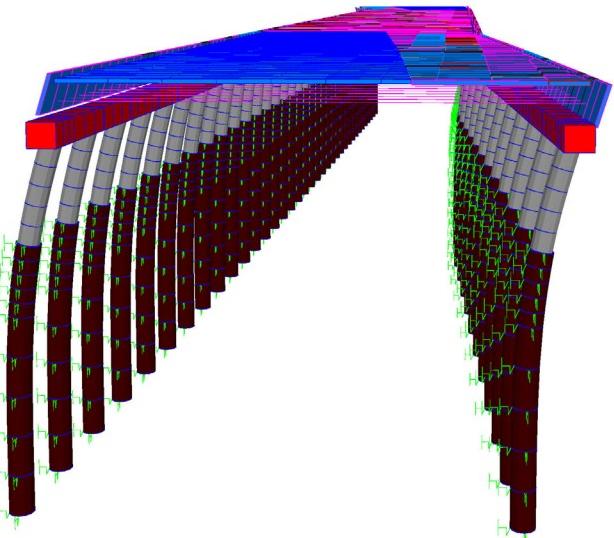


- Development of a HEC-RAS model for hydrological considerations
- Development of a 3D model of the non-standard structure for seismic considerations (see Figure 2-2)

UNDERSTANDING OF THE REQUIREMENTS

HSR requirements are different from typical rail facilities. For example, the weight of the train combined with the speeds at which they travel as well as the forces created when they stop and start require special engineering solutions for the HSR structures. In addition to a thorough understanding of the Authority's design criteria (*Book III – Design Criteria and Directive Drawings*), our team brings an in-depth understanding of HSR design and construction methodologies. Euroestudios staff participated in the development of the European HSR guidelines, including Instructions and Recommendations for the Development of HSR Trackway Civil Infrastructure projects for the Administración de Infraestructuras Ferroviarias (Spanish HSR authority), and other industry-recognized HSR guidelines. We understand the guidelines and also know when and how to improve upon them. For example, we find that curves and grades sometimes need to be optimized beyond guideline recommendations for improved passenger comfort and a smooth ride at high speeds.

Figure 2-2: Non-standard Structure 3D Model for Seismic Considerations

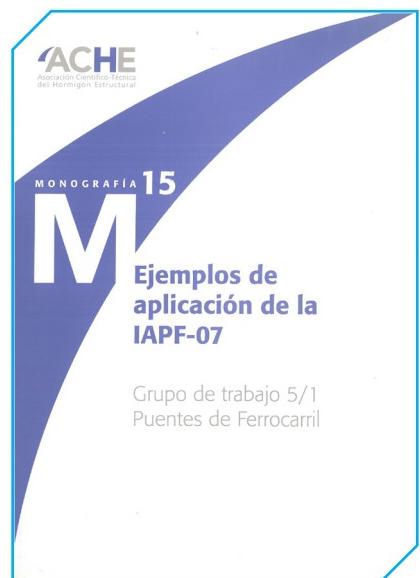


Ferrovial Agroman holds several patents for HSR track installation and Euroestudios has participated in the development of European HSR guidelines.

RECOGNIZING CONSTRAINTS

Our design approach recognizes constraints by taking a collaborative approach to project delivery. Our design team works with our environmental, right-of-way, traffic management, scheduling and construction experts to develop a holistic plan that responds to the project's needs. This has been our approach from the start and has already resulted in significant benefits to the project. Examples include:

- A reduction in right-of-way acquisitions by approximately 100 acres
- Shifting the alignment to avoid the water tower and eliminating the need to relocate the pump station facility
- Providing a three-span structure at Poso Creek enabling column placement to avoid the wetland area
- Reducing visual impacts caused by a two level elevated structure by replacing the viaduct section in Wasco with an at-grade alignment
- Reducing noise impacts by depressing 6th Street and Poso Avenue
- Improving air quality by reducing truck traffic as a result of our lower profile design which requires less embankment fill
- Using ditches in lieu of concrete walls as an intrusion barrier improves sustainability by reducing emissions from haul-truck traffic



Euroestudios staff are among the authors of the Monograph 15 which details current standards in Spain for HSR railway bridge loads.





- Future HSR noise barriers will have the added benefit of reducing noise levels from BNSF Railway trains
- Minimizing rail and vehicular traffic impacts by using precast beam construction for structures
- Raising the alignment near Poso Creek to comply with the 100-year storm event

Trackable Submittal Identification

For submittals, the activity identification number will tie to the submittal numbering in document control, allowing the Authority to directly track the submittal schedule. Monthly look-ahead reports will identify planned submittals for the next three weeks. Critical submittals will be identified for priority processing.

We've Done It Before

On the Bogotá Subway Project, Euroestudios mobilized more than 12 engineers within 30 days, 15 technical staff within 30 days and achieved full mobilization within three months.

Supported by our design-build integrators, our design team is skilled at maximizing the benefits of design-build project delivery. Not offered by most construction firms, this team of engineers is involved from the development of our statement of qualifications and proposal through post-award design and construction, providing maximum continuity and value on projects.

DESIGN DOCUMENT SUBMITTALS

A lengthy design submittal revision process is in no one's best interest — least of all the project's. Our objective is to get it right the first time and minimize comments and questions and the need to resubmit. We accomplish this by having a thorough understanding of the requirements and working collaboratively with the Authority and other project participants (such as the City of Wasco, Caltrans, Amtrak, BNSF Railway, Kern County and utility and property owners) during the design development process to clarify and resolve issues prior to design submission.

We also implement a thorough design quality process. Submittals are checked by the design team and reviewed by California-licensed professional engineers who are independent of design production. These senior engineers will develop check prints and project-specific checklists that become part of the permanent quality documentation.

SKILLED MANAGEMENT PERSONNEL AND STAFF

Under the leadership of Design Manager Ignacio Navarro, PE, our team includes senior engineers with civil infrastructure and structural design expertise. Ignacio and his team have delivered numerous transportation infrastructure projects with similar technical complexities and are experienced at working collaboratively in the fast-paced design-

Mobilizing Design Staff



NORTH TARRANT EXPRESS SEGMENT 2W

As a consultant to Ferrovial Agroman, OTHON served as lead designer for Segment 2W of this design-build project. This \$800 million segment included 7.5 miles of roadway and civil infrastructure work. OTHON mobilized 10 professional engineers to their nearby office in Dallas within 60 days, and grew the team to include 20 professional engineers and a support staff of 40 including junior engineers, technicians and administrators working out of five office locations. The team held weekly internal video conference meetings to set expectations and resolve challenges, and used ProjectWise to efficiently coordinate the development of plans and verify the latest drawings were being used.





build environment. Our designers are responsible for developing and producing complete and accurate engineering documents. The engineer of record for each discipline has the full responsibility that goes with signing the drawings and specifications in California.

Our design team is supported by design-build integrators who are cross-trained designers and constructors with extensive design-build experience. Experts in all of the major components of civil infrastructure and HSR, they are skilled at driving innovation and improving constructability specifically in the fast-paced, design-build environment.

DESIGN STAFF ORGANIZATION AND LOCATION

Ferrovial Agroman, Euroestudios and OTHON have extensive experience collaborating on large design-build transportation projects. Euroestudios provides HSR alignment, structural and systems engineering experience, and will deliver the required design personnel for the HSR alignment and structure design. OTHON's extensive experience with large civil design-build projects includes traffic management, structures, pavement engineering and utility work on Ferrovial Agroman projects allowing them to quickly mobilize engineers and support staff who are familiar with our team's requirements and procedures.

Under the leadership of our in-house design-build integrators, information and direction is streamlined to our design leads, facilitating the development of coordinated design solutions. Design leads will have teams of two to 12 engineers and design consultants. Additional support will be provided by design consultants hired by the engineers during the peak design. As construction begins, staffing may be reduced as work flow slows; however, designers will always be available for additional consultation even after completing their tasks on the project.

Examples from the proposal phase that demonstrate the effectiveness of our organizational structure to produce collaboration include:

- Responding in less than five days to the SunnyGem viaduct addition with potential ATCs (including revised design drawings) that quantified the changes and verified truck movement suitability
- Expediting the development and presentation of new ATCs when the ATC period was extended with only a couple of days of notice

We maintain continuous communication within the team located in multiple offices using video conference, email and calls with Skype or Go To Meeting (sharing screens to explain aspects of the project). We also use ProjectWise and an FTP site to share documents, plans and notes.

TASK FORCE GROUPS. Our design team is organized in a matrix with design discipline leads responsible for engineering work elements such as structures, civil and roadway, and task force leads focused by technical discipline to develop specific solutions. Our designers are responsible

Effective Communication Between Design Offices

CAHSR CONSTRUCTION PACKAGE 4

For the development of this proposal, we modeled the communication approach we will use to implement the project. Our design-build integrators serve as the communication hub, establishing task force groups and conducting meetings in person or by video conference. With today's technology, staff in diverse locations can efficiently view and discuss the same drawings or other documents. All team members have access to the same cloud-based document storage, so the team works on and edits the same files, using the established version control protocols. This approach facilitates involvement of experts who are unable to relocate to a central office.





Design Acceleration

NORTH TARRANT EXPRESS SEGMENTS 1 AND 2

Strategies the design-build team (including Ferrovial Agroman and OTHON) implemented to complete the North Tarrant Express Segments 1 and 2 project nine months early included performing concurrent design and construction in eight zones of the project for production of stand-alone utility design packages to expedite the schedule and reduce costs. The design-build team identified right-of-way acquisitions needed for early construction packages, and coordinated subsurface utility engineering services and utility relocations with four cities and 18 utility and gas line companies.

for developing complete and accurate engineering documents, and contributing their experience on HSR design. Our task force teams, including maintenance of traffic, structures, drainage, utilities, etc., facilitate communication to encourage real-time, over-the-shoulder, plans-in-hand design reviews and to resolve potential issues quickly.

Our task force groups, including members of the design, construction, quality and management teams as well as the Authority and third parties, coordinate the work for a given geographic area. The task force groups will work together to develop the approach, plans and quantities as well as value-added features including opportunities for innovation and design and construction efficiencies. After award, subject matter experts will be included in task force meetings to identify and begin the process of procuring resources for work that will begin first.

After notice to proceed and throughout construction, the task force groups will work together to foster communication with third-party stakeholders, resolve issues and focus on project details to ensure compliance with contract requirements. They will meet on a regular basis to integrate solutions across all disciplines. Their collaboration and efficient decision-making will be essential to maintaining the project schedule.

DESIGN OFFICE LOCATION. To date, we have used a multi-office execution approach to develop the design. While we will continue this approach upon award, design leads for geotechnical, environmental, utilities, structures and earthwork will be dedicated to the project and co-located with our construction personnel at the our project office located along the corridor in the Wasco area. The project office will be up and running within 60 days of notice to proceed, and by 180 days, we anticipate having demolition, earthwork and foundation designs complete for parcels that have already been acquired or will be acquired within the first 12 months.

We routinely use co-location on large projects — we have found that it provides unprecedented levels of communication and problem-solving capability. Resolution of design and constructability challenges is expedited and decision-making is streamlined.

Value Engineering Solutions

I-635 LBJ EXPRESS

Our team developed numerous value engineering concepts. One of the most significant involved changing the initial four-level interchange to a three-level design resulting in reduced traffic disruption, improved constructability and a shorter schedule by three months.

PROJECT EXAMPLES

Our team brings extensive civil infrastructure design experience including HSR, roadway/highway, bridge structure, utility and drainage elements. Examples of our team's recent successes can be found throughout the text.





1. First 180 Days – Design Progress

During the first 180 days, our design team will update and build upon information gained during the proposal phase to refine the design and develop the Design Baseline Report. Our engineers will conduct field visits, update our HEC-RAS studies, perform advanced geotechnical utility investigations and conduct site and environmental surveys. Our designers will also participate in task force meetings with third parties including utility owners, BNSF Railway, Caltrans and other third parties. Figure 2-4 provides a summary of our design team's activities during the first 180 days.

2. First 180 Days – Field Activities

Field mobilization will begin well in advance of the completion of the first design packages. Full site-specific mobilizations should take less than one month each and dictated by receipt of construction permits for early work packages. In the first 180 days, we will prepare all of the plans required for safe and effective construction (see Figure 2-3). Within the first 60 days, we will submit the initial documentation required for equipment, construction phasing, commuting workers, and estimated waste and demolition debris.

FIELD SURVEYS. To supplement our current information, we will conduct multi-discipline surveys using Central Valley-based consultants/subcontractors that know the local agencies and requirements. Surveys will include:

- **Subsurface Investigations** – Geotechnical surveys, potholing and subsurface imaging of critical utilities
- **Cultural, Architectural and Archeological Document and Field Searches** – Including surveys of local experts, landowners and pedestrians, seeking additional information about the alignment and visually searching for evidence of potential impact areas
- **Environmental and Biological Surveys** – Investigating the footprint to confirm evidence of protected species and habitats, planning

COMMITMENT

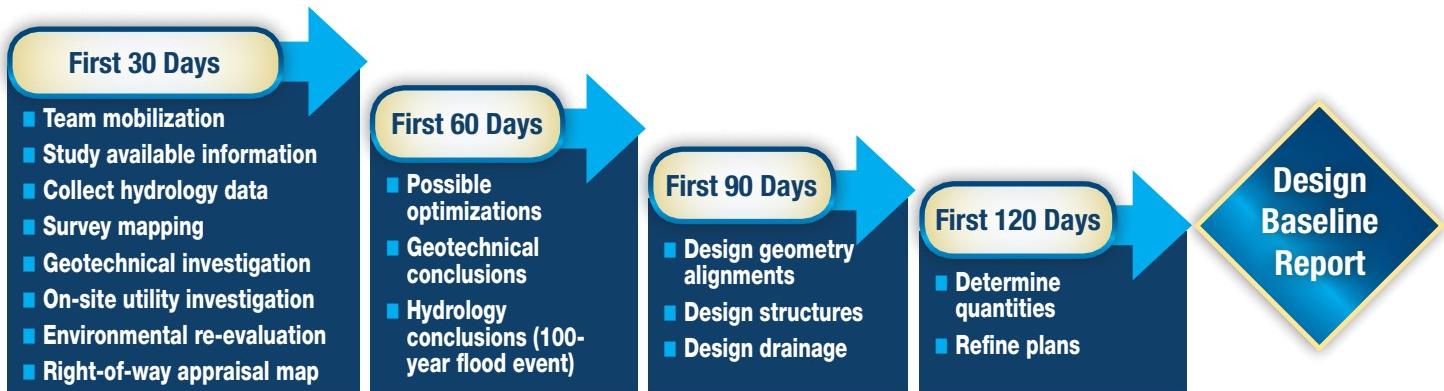
Our design, advanced in accordance with the Design Baseline Report's requirements, will be updated and refined based on further investigations, field verification and detailed surveys upon notice to proceed.

Figure 2-3: Construction Plans

Plans to be Prepared in the First 180 Days

- Schedule submittals leading to corrected baseline schedule
- Environmental compliance plan
- Safety and security management plan
- Safety and security certification plan
- Public involvement plan
- Quality manual
- Interface management plan
- Sustainability management plan
- Water conservation plan
- Verification and validation plan

Figure 2-4: Design Team Activity Start Dates





We've Done It Before

With an established relationship with BNSF Railway, our team understands their design and construction requirements, has experience with their review process and standards and appreciates the heightened level of safety and security required when working on and around their facilities. Projects where we have collaborated with BNSF Railway include:

- North Tarrant Express Segments 1 and 2
- Alameda Corridor Washington Boulevard/Santa Fe Avenue Grade Separation
- Valley View Grade Separation

With a history of going beyond the minimum geotechnical elements requirements, we will consider the following strategies for this project:

- Constructing test embankments to monitor settlement and obtain critical parameters for improved construction quality
- Using dynamic and static load tests for drilled shafts to improve quality
- Installing vertical and horizontal inclinometers, piezometers and load plates to monitor and confirm settlement and stability

weed control, and identifying and locating areas of biological or environmental concern

- **Field Benchmarks** – locating and installing field benchmarks within the right-of-way (to be maintained and resurveyed every six months)

INITIAL STAKEHOLDER OUTREACH AND COMMUNICATION. During the first 60 days, we will mobilize our public outreach team and managers to begin communication with third parties including the public, public agencies (such as Caltrans, the City of Wasco, and the counties of Tulare and Kern) and adjacent property owners (such as SunnyGem, Amtrak and Certis). We will conduct charrettes with those directly affected by the alignment to determine if minor design modifications can be implemented to reduce impacts. We will also meet with local agencies, including city and county emergency services and the California Highway Patrol, and we will hold small business outreach networking meetings.

Initial meetings with BNSF Railway will focus on the shoofly design, gaining an understanding of their operations, design and signal requirements and relationship building. At these initial meetings Railroad Coordinator Jon Marshall, PE, will work with the railroad to integrate their needs with the project's needs, and, as the project progresses, he will provide regular coordination and communication.

GEOTECHNICAL FIELD WORK. We will conduct more thorough field and laboratory investigations, including boreholes using standard penetration tests, cone penetration tests, test pits and other geophysical tests, to develop a complete database of the existing subsurface conditions. Soil samples will be recovered for detailed laboratory evaluations related to soil classifications, index properties, soil strengths and cyclic soil properties. Because the location of the groundwater is crucial for seismic liquefaction assessment and global stability evaluations, we will install standpipe or vibrating wire piezometers.

Geotechnical investigations will also be completed for all borrow areas to verify suitability of the material and compliance with Federal Highway Administration's *Project Development Design Manual* and *Geotechnical Technical Guidance Manual* requirements.

CRITICAL PATH WORK

The BNSF Railway realignment and shoofly work is on the critical path for the duration of the project. Concurrent critical paths include right-of-way acquisitions, environmental approvals and utility coordination work. As field activities ramp up, utility relocations, bridge foundations and earthwork will become critical. See *Section 1.B – Substantial Completion Approach and Commitment* and the *Preliminary Baseline Schedule* binder for details on specific critical path activities.





B. MAJOR ELEMENTS

Major elements of Construction Package 4 include the earthwork and structures for rail, roadway and drainage. Our design optimizes the preliminary design while maintaining design standards. Earthwork and right-of-way have been substantially reduced by means of ATC 11 which reverse stacks the HSR intersections at three locations. Additionally, the length of the Wasco Viaduct has been reduced with ATC 2 which involves lowering the HSR's vertical alignment to grade through Wasco. Through ATC 13, our design contemplates a minor realignment of HSR track to eliminate the need to relocate Semitropic Water Storage District pump station located at 4718+00. Each of the ATCs are detailed on pages 37-39.

EARTHWORK

Due to drainage needs and wildlife crossings, we raised the profile resulting in significant earthwork, particularly in the northern segment (Segment 1). To reduce earthwork quantities, we implemented ATC 11 which reverses the stacking of the Garces Highway, Pond Road and Peterson Road intersections with the HSR alignment. In the preliminary design these three roadways pass over the HSR track, requiring significant embankments to achieve the required additional 27 feet of clearance. Our design elevates the HSR vertical alignment to pass over these three roadways, requiring a lower profile embankment which reduces earthwork by nearly one million cubic yards.

Because lateral separation between the closest HSR track centerline to conventional railroad right-of-way is less than 102 feet at the final part of Alignment Subsection L1 (Poso Creek) and Alignment Subsection WS1 (Wasco-Shafter), we are providing an intrusion barrier. Our design maximizes use of the ditch section intrusion barrier (Figure 2-5) whenever possible to balance earthwork.

We further reduce earthwork at McCombs Road and Merced Avenue by reducing the 4:1 embankment slopes to 2:1 outside of the clear zone.

Lowering the profile reduces the embankment for grade separations, providing additional reduction in the amount of fill required. Because there are no wildlife crossings in Segment WS1 (south of Whisler Road to north of Poplar Avenue), the vertical alignment in this section has been lowered to at grade, requiring minimal fill.

GEOTECHNICAL ENGINEERING

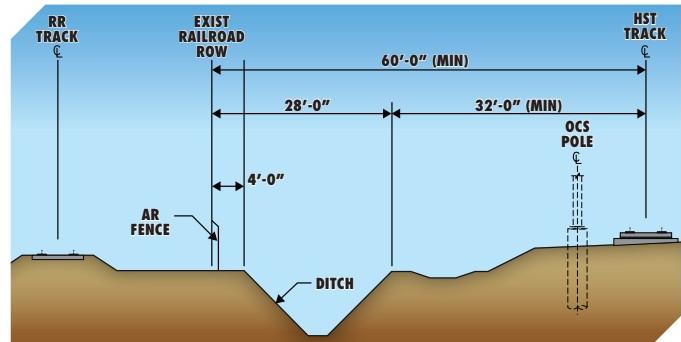
Geotechnical and seismic design is a major aspect of the proposed project. We performed a thorough review of the documents as well as various seismic and faulting maps and performed design checks to validate information in the Geotechnical Baseline Report. The major geotechnical elements in our design include at-grade embankments, approach embankments,

COMMITMENT

Upon completion of field investigations, our current design will be re-evaluated for compliance with geotechnical, structural and seismic requirements.

Reverse stacking of three HSR/roadway intersections reduces earthwork by nearly one million cubic yards improving the project's environmental footprint by reducing the amount of material to haul to the site.

Figure 2-5: Intrusion Barrier Ditch Section





mechanically stabilized earth (MSE) walls, rigid concrete cantilever retaining walls and drilled shafts for deep foundations and excavation support.

EMBANKMENT. Including estimates for settlements and global slope stability with reference to static and pseudo-static (seismic) loading conditions, our embankment design, analysis and construction will conform to settlement, undrained shear strength and plate load deformation modulus from the second loading (Ev2) requirements. While the Project Design Criteria specifically outlines the required material compositions of the embankments, we performed a separate review to identify suitable material both from within the project limits and also from borrow sources and processing quarries that strictly adheres to the requirements.

Based on our review and analysis, we determined that the geo-structures will be founded on granular/coarse materials along the alignment, and that settlement of these geo-structures will occur relatively fast and likely within the construction period. We will strictly adhere to and/or exceed the requirements for settlement monitoring as outlined in *Project Design Criteria Chapter 10* and *Standard Specifications Section 31 09 13*. Geo-structures will be instrumented and monitored such that settlement levels off following completion of the structure. The settlement period is estimated to be less than four months. Additional monitoring measures include installation of vertical and horizontal inclinometers, piezometers and load/settlement plates to monitor and ensure proper settlement.

MSE WALLS. MSE walls are coherent gravity structures typically comprising concrete segmental facing elements with reinforced earth backfill. AASHTO Bridge Design Load and Resistance Factor Design method was considered in the analysis which also included checks for bearing resistance, overturning, sliding and global stability for all maximum design loads including seismic. For the preliminary design, we considered MSE wall systems supplied by Reinforced Earth Company that consist of alternating layers of strip reinforcement and granular backfill conforming to the requirements in the *Project Design Criteria Manual* and Section 31 05 00 of the Standard Specifications. Bearing resistance evaluations were based on laboratory strength and standard penetration tests and cone penetration test field data. We evaluated and prepared the foundation subgrade to satisfy the design criteria which we will do again during final design.

RETAINING WALLS. ATC 2 (which lowers the alignment to grade through Wasco) includes a cut wall for the cross streets traveling under the HSR and BNSF Railway alignments. The design includes a cut wall composed of reinforced drilled shafts.

FOUNDATIONS. Bridge structures for the overpasses, underpasses and viaduct will be supported on deep foundations comprising drilled shafts. We based the preliminary design evaluation of the axial compression resistance of the deep foundations on the data obtained from the cone penetration test which was evaluated based on various empirical methods such as cone





penetration testing LCPC and AASHTO standard penetration test method. The foundations were also designed for inertial loads from the superstructures, liquefaction, lateral spread and other seismic effects such that they will behave elastically under the design operating basis earthquake with no collapse under the maximum considered earthquake.

Per the Geotechnical Baseline Report, no liquefaction nor lateral spread potential has been assumed in our proposal. Upon award, we will conduct a thorough and detailed investigation of liquefaction potential and lateral spread to verify the Geotechnical Baseline Report's assumptions.

For structures other than the viaduct, our design includes multi-drill shaft pile footings. The diameter of the pile, along with designing the appropriate spacing of the piles, maximizes the capacity of each pile and avoids "group effect" which reduces the individual pile capacity. We will conduct additional analyses during detailed design including a soil structure analysis using software such as FB-Multipier, Group and/or LPile.

All geotechnical analyses for deep foundations will take into consideration scour effects and the 100-year flood plain. Upon award, a foundation testing and quality assurance program will be detailed and rigorously followed to conform to the requirements in *Project Design Criteria Section 10.6.4.3* and *Standard Specifications Section 31 63 29* which outline the intervals and requirements of each method test shaft and load test shaft.

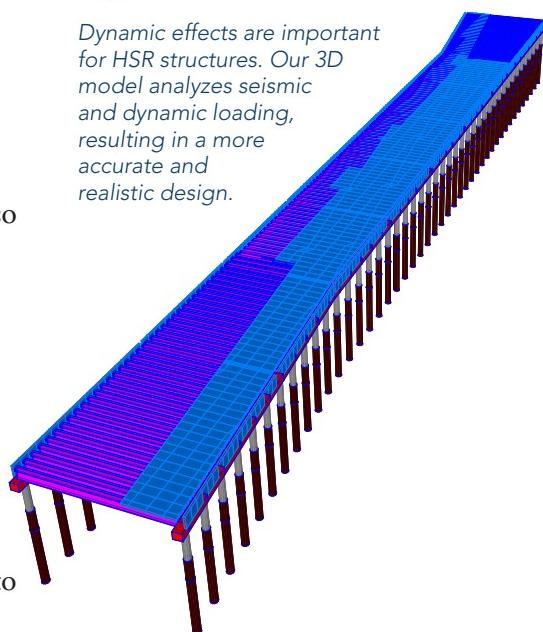
STRUCTURES

The most significant structure is the Wasco Viaduct which includes the non-standard HSR structure over the BNSF Railway tracks (Figure 2-6). By bringing the alignment to grade through Wasco (per ATC 2), the total length of the original structure has been substantially reduced from 15,856 feet to 2,646 feet. Our design also includes the following 13 additional structures:

- Three HSR U-section structures (Figure 2-7 on the next page) over Garces Highway, Pond Road and Peterson Road (per ATC 11)
- Three HSR U-section structures (Figure 2-7 on the next page) at Poso Creek, SunnyGem and SR 46
- One HSR structure over Kimberlina Road
- One BNSF Railway structure over Kimberlina Road
- Two underpasses in Wasco for the depressed sections of 6th Street and Poso Avenue to go under the at-grade HSR and BNSF Railway tracks (per ATC 2)
- One pedestrian underpass from the intersection of G Street and 7th Street to the Amtrak platform (per ATC 2)
- Two roadway structures for McCombs Avenue and Merced Avenue to cross over the HSR alignment

Figure 2-6: Non-standard Structure

Dynamic effects are important for HSR structures. Our 3D model analyzes seismic and dynamic loading, resulting in a more accurate and realistic design.





We use spans before and after the non-standard structure to clear the BNSF Railway right-of-way.

The non-standard structure will use precast I-girders with cast-in-place slabs connected to columns. They will provide additional vertical clearance (24 feet versus the required 23.4 feet). This structure type reduces the number of joints for reduced bridge maintenance which also reduces potential interruption to rail operations due to maintenance. Optimizations of the non-standard structure include:

- Reducing the bent cap from 10 feet by 12 feet to 8 feet by 7 feet
- Reducing the diameter of the drilled shafts from 9 feet to 7 feet

Other structural solutions and their benefits include:

- **Eliminating At-grade Crossings** – The two structures located at 6th Street and Poso Avenue eliminate two existing at-grade crossings with BNSF Railway tracks for improved safety and improved mobility across the alignment. We provide a two-track shoofly (one for the main line and one for the siding track) to maintain BNSF Railway operations during construction and the final underpass structure will span the entire width of the BNSF Railway right-of-way.
- **Walls** – Overall, our design uses walls to optimize structure length and reduce the number of spans. We will make soil improvements (such as over-excavating and replacing with processed materials) as needed in areas where we use high walls.
- **Accommodating the Ultimate Configuration** – The underpass at SR 46 accommodates future widening in the Ultimate Configuration as shown in the City of Wasco's *General Plan*. Our single-span design also enables us to remove a bent for added driver safety on SR 46.
- **Additional Clearance** – Our design provides a minimum vertical clearance of 16.5 feet for underpasses at Garces Highway, Pond Road and Peterson Road — an additional 1.5 feet beyond what is required to accommodate taller vehicles.
- **Precast Beams** – Our preferred solution for structures over existing railroads and roadways is to use precast beams. This approach enables BNSF Railway to operate without interruption and greatly reduces impacts to roadway traffic.

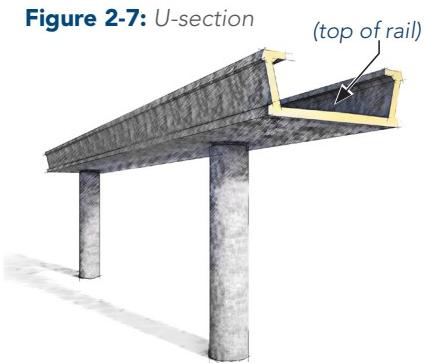


Figure 2-7: U-section
Used around the world for other HSR viaducts, the U-section deck (used at six locations) transfers the load to the structure's lateral girders, enabling a lower profile which reduces earthwork.

RAILROAD

Our team will use a number of value-added approaches to ensure successful and timely BNSF Railway approvals for the Wasco main line and siding shoofly (for ATC 2) and the main line realignment. We will gather data regarding BNSF Railway's existing train operations through the site including the number, length and frequency of trains to present informed design alternatives that support BNSF Railway operational objectives. The project is located in BNSF Railway's centralized traffic control signal territory and will require engaging the railroad for the design of all temporary and permanent signal elements required for the shoofly design (for ATC 2). Our railroad task force group will work collaboratively with BNSF Railway to modify track design to minimize





impacts on existing signal systems and avoid critical signal facilities where possible, to save costs. Our current shoofly design includes temporary track work that could remain in place following construction and be of value to BNSF Railway. We will engage Amtrak similarly in the task force groups with respect to the passenger platform and amenities.

DRAINAGE

Drainage in this project is one of the most challenging issues since the project runs through a floodplain and there are significant sheet flows through the adjacent agricultural lands.

CROSS DRAINAGE, FLOODPLAIN CULVERTS, POSO CREEK,

CHANNELS. We developed a new HEC-RAS model that resulted in 68 culvert crossings along this 21-mile alignment. While we anticipate some variation in the count during final design, generally, cross culverts can be categorized as irrigation culverts (three), floodplain culverts (24) and wildlife crossings (41).

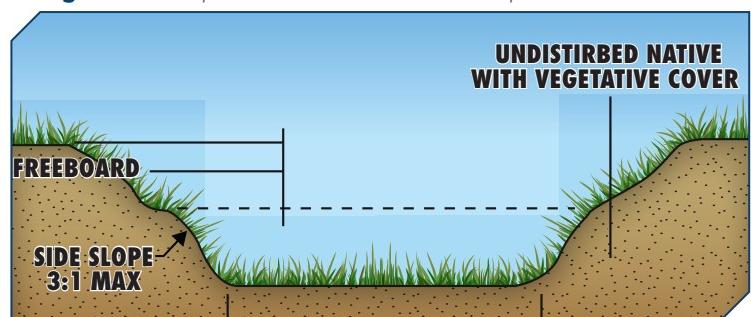
Using the HEC-RAS model to corroborate the FEMA information, we designed the Poso Creek Bridge and all other culvert crossings to accommodate the 100-year flood event. We also optimized the number of culverts by increasing the distance between them while maintaining capacity for the 100-year flood event. To mitigate excess concentration of flow at the low points, additional cross culvert locations will be provided that distribute cross flow more evenly across the alignment and maintain consistency with existing flow patterns.

In the Wasco urban area, the sheet flow is directed to the stormwater system. This network includes pipes and detention ponds to control flooding. Three pump stations are provided at the three underpasses in Wasco (6th Street, Poso Avenue and Kimberlina Road) that are connected with a pipe to the storm drain detention basins.

For parallel drainage, our preferred approach is to provide trapezoidal swales along both sides of the alignment (Figure 2-8) which is an environmentally friendly solution since it does not use concrete. When the right-of-way is constrained or there is excessive flow, parallel pipe systems can supplement the ditches to handle the additional flow.

In the Wasco urban area where we have lowered the alignment to grade (ATC 2) and the site is constrained by the BNSF Railway corridor and G Street, we provide a closed drainage section for parallel drainage.

Figure 2-8: Trapezoidal Cross Section Example





ATC 2 Shoofly Alternatives

We developed two shoofly alternatives to facilitate construction of the 6th Street and Poso Avenue underpasses and provide replacement tracks for BNSF Railway operations. Design considerations for both include:

- 79 mile-per-hour main line speed (to meet BNSF Railway timetables)
- Two-phase bridge construction, allowing concurrent construction of BNSF Railway and HSR bridges
- Temporary Poso Avenue at-grade crossing over BNSF Railway right-of-way
- Minimum 15-foot horizontal construction clearances
- Access to Wasco Coal Terminal

Our preferred alternative provides a 7,400-foot main line shoofly west of the BNSF Railway yard and a 200-foot modification to the Amtrak station platform.

WILDLIFE CROSSINGS

We will provide 41 wildlife crossings following recommendations from the environmental impact report. Many wildlife crossing structures will serve both wildlife and hydraulic crossing purposes in locations where flood relief for a large storm event is required. To reduce the trackway's embankment and reduce the amount of fill needed, the wildlife crossings have been lowered the permitted 1.5 feet from ground level (with the appropriate ramp) enabling the HSR profile to also be lowered.

ALTERNATIVE TECHNICAL CONCEPTS

ATC 2 – AT-GRADE ALTERNATIVE TO PORTION OF WASCO VIADUCT

This ATC reduces the length of the Wasco Viaduct by lowering the HSR alignment to at grade through the City of Wasco. Benefits include substantially reducing visual impacts associated with a tall structure, reduced cost, the elimination of two existing at-grade BNSF Railway crossings, significantly improving safety.

The HSR track will cross over 6th Street and Poso Avenue which are designed as depressed underpasses, maintaining mobility across the HSR alignment. We also maintain access and turning movements by providing the adjacent at-grade roadways. Figure 2-9 shows how this works at 6th Street; Poso Avenue is the same. The roadway and pedestrian underpasses meet AASHTO and American with Disabilities Act (ADA) requirements.

Using INMI software, we performed detailed noise studies, including a 3D model (Figure 2-10 on the next page), of both the original design and our solution. We found that our ATC 2 solution resulted in no significant

Figure 2-9: 6th Street Underpass – Comparison





change in noise levels as compared to the viaduct solution and also provided several improvements. Other important conclusions include:

- Noise reduction from traffic on 6th Street and Poso Avenue due to the depressed sections
- A reduction in the amount of noise walls to be built in Construction Package 5 since, by lowering the alignment to grade, the adjacent commercial and industrial buildings attenuate noise impacts to the residential buildings behind them (the viaduct design would significantly increase the noise impacts to the residential areas as nothing would attenuate the noise)
- Added noise mitigation from the future HSR noise walls that will be at grade (rather than on an elevated structure) where they will also mitigate noise from BNSF Railway

This ATC eliminates the Wasco Amtrak Station but maintains connectivity to the Amtrak platform. We met with the City of Wasco, understand their preferences and will work with them to design an aesthetically pleasing gateway that provides access to the Amtrak platform that is equal to or better than the existing conditions.

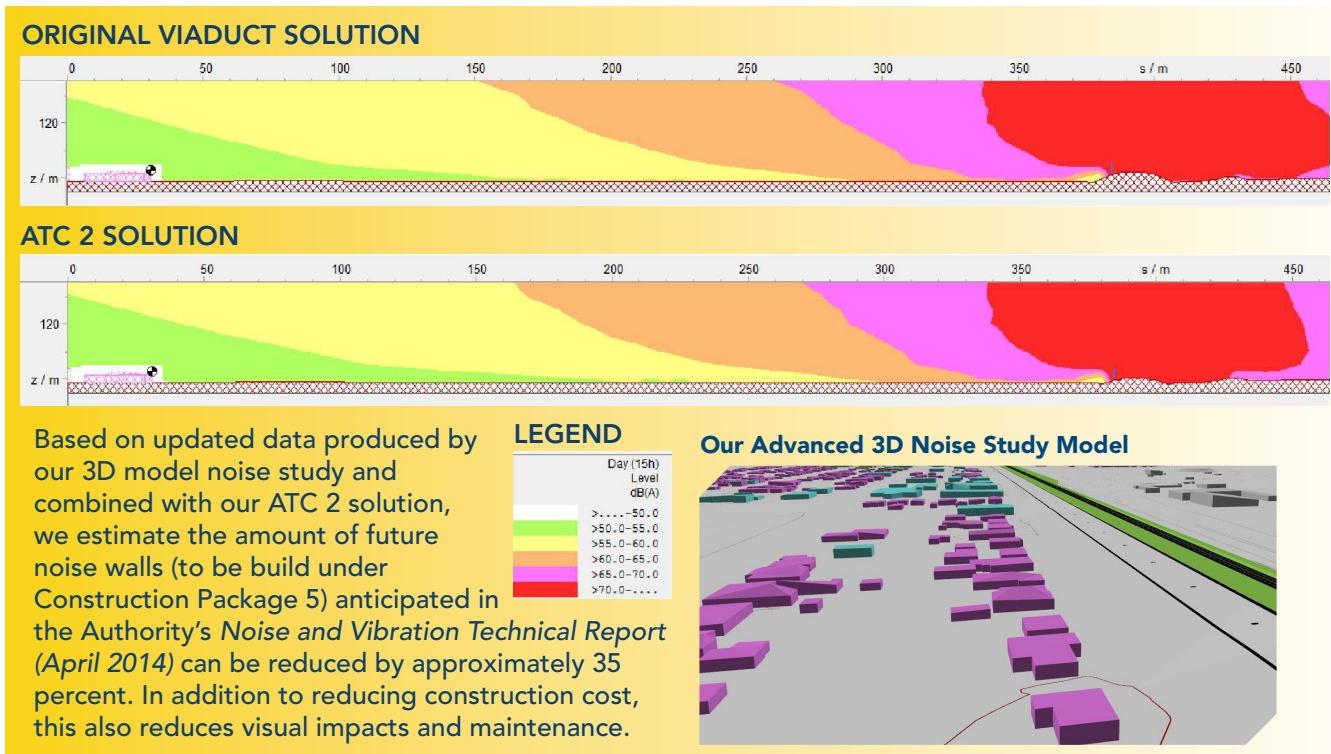
ATC 11 – REVERSE STACKING AT THREE LOCATIONS

While the preliminary design shows Garces Highway, Pond Road and Peterson Road going over the HSR alignment, this ATC raises the HSR alignment so that it passes over these three roadways using a U-section structure. This reverse stacking reduces the amount of earthwork by nearly

Depressed underpasses at 6th Street and Poso Avenue improve aesthetics for Wasco residents compared to a large overhead structure.

While the minimum vertical clearance to cross over local roads including Garces Highway, Pond Road and Peterson Road is 15 feet, our design provides 16.5 feet of clearance to accommodate possible future improvements.

Figure 2-10: Noise Study Comparison – Acoustical Cross Section Showing No Significant Difference at Station 5615+00





Shifting the HSR alignment eliminates the conflict with Semitropic Water Storage District's water tower as well as conflicts with a power line and two irrigation systems.

one million cubic yards since fill needed for the HSR alignment to go over the roadways is considerably less than the alternative due to difference in the minimum vertical clearance requirements — 27 feet for roadways over the HSR versus 15 feet for the HSR over roadways. As an added benefit, we are providing a total of 16.5 feet of vertical clearance (1.5 more feet than required for these specific roadways) to comply with Caltrans' *Highway Design Manual*) and enable possible future improvements.

Additional benefits include:

- Reduced visual impacts achieved by using a lower structure (half the height of the original structure)
- Reduced future bridge maintenance costs as the overall amount of structure area is reduced
- Improved safety and reduced risk associated with maintenance by a third party on roadway structures traveling over the HSR alignment
- Improved driver safety during construction by eliminating extensive traffic management and maintaining the existing alignment with which drivers are familiar
- Easier maintenance because the HSR bridge abutments will be located within the Authority's right-of-way

ATC 13B – ELIMINATING PUMP STATION RELOCATION

In the original plans, the water tower for Semitropic Water Storage District's pump station property (at station 4718+00) was in conflict with the original alignment, requiring the entire pump station to be relocated. To avoid the relocation, we shifted the HSR alignment approximately 60 feet to the east, away from the pump station. This solution minimizes impacts by enabling the Semitropic Water Storage District facility to remain in its existing location and also avoids other utility conflicts in the area including a power line and two irrigation systems. This solution also minimizes environmental impacts, including debris and pollution, associated with relocating the pump station.



Our design includes surface enhancements and formliner texture/pattern treatments for the 6th Street and Poso Avenue underpass walls.

AESTHETIC FEATURES

Design elements that improve the project's overall aesthetics include:

- Using a U-section rather than a box girder structure which lowers the alignment resulting in a reduction in visual impacts
- Incorporating the City of Wasco's logo in the concrete parapet of HSR structures located in the city
- Providing consistent fencing throughout the City of Wasco
- Surface design enhancements and formliner texture/pattern treatments for the 6th Street and Poso Avenue underpass walls
- A flat panel design of the U-section that allows for the addition of aesthetic features, such as street names or murals, to be incorporated





C. SETTING THE ALIGNMENT

MINIMIZING RIGHT-OF-WAY ACQUISITIONS AND IMPACTS

Our right-of-way, design and construction teams worked closely during the proposal phase to develop a design that minimizes the need to acquire and/or impact properties adjacent to or near the alignment.

We analyzed the alignment options and developed a matrix for avoiding properties that could be impacted. For example, we found that by shifting the alignment 60 feet to the east (ATC 13b), we could avoid relocating the Semitropic Water Storage District's pump station property while also significantly reducing utility impacts in the area.

However, the most significant reduction in right-of-way acquisition results from reverse stacking the Garces Highway, Pond Road and Peterson Road grade separations (of ATC 11). By keeping the existing roadways at grade and taking the HSR alignment over them, we reduce the amount of right-of-way needed by approximately 100 acres.

Our design also features elements that reduce right-of-way acquisitions and impacts by reducing embankment footprints. These include:

- Lowering the HSR alignment reducing the area of the slopes
- Lowering the McCombs Road and Merced Avenue overpasses, reducing the area of those embankments
- Using 4:1 slopes with a 2:1 slope outside of the clear zone, creating a smaller embankment footprint
- Developing an at-grade section with a smaller embankment in areas where no wildlife crossings are needed

In addition to the three most significant adjacent properties identified by the Authority (SunnyGem, the Amtrak Station and Certis), we developed mitigations for several smaller property owners that could be impacted. There are several agricultural neighbors with driveway access and irrigation access we will maintain, particularly during the harvesting season. We developed alternate solutions such as relocating driveway access or irrigation access or scheduling the work to avoid harvest and tree pollination seasons.

In areas where the vertical alignment has been lowered, the roadway that goes over the trackway can also be lowered, reducing the amount of embankment and the amount of right-of-way needed.



Shifting the HSR alignment significantly reduced impacts to two irrigation systems.

Minimizing Right-of-way Acquisitions



MADRID – BARCELONA – FRENCH BORDER HSR, LLEIDA – MARTORELL

Euroestudios designed eight miles of double-track for the busiest segment of Spain's HSR corridor, this link from Madrid to Barcelona and the French border. This alignment crosses an urban area at high speeds and required design considerations for right-of-way availability. Euroestudios' goal was to reduce the amount of right-of-way required by designing the new rail line as close as possible to the existing alignment (which was largely below grade) using cut-and-cover construction. This solution greatly enhanced public safety and aesthetics. Euroestudios worked with the owner, the city and impacted stakeholders to develop design solutions that enhanced aesthetics, accommodated budgets and minimized impacts to the critical rail operations during construction.





COMMITMENT

We commit to partnering with the Authority to expedite acquisition of the new parcels resulting from the alignment shift (ATC 13b).

RIGHT-OF-WAY SERVICES

Our solution to shift the alignment (ATC 13b) eliminates the need to acquire some property while adding other parcels. We commit to partnering with the Authority to facilitate the acquisition of these parcels. Our right-of-way acquisition team, led by Dennis Sedlachek, SR/WA, R/W-RAC, brings extensive experience and a proven approach that promotes effective quality management for the entire process and verifies compliance with all federal, state and local laws. A fully integrated part of our team, they work closely with our design and construction teams to develop a complete understanding of the project and the construction plan resulting in a streamlined acquisition process that enables them to be far more effective as they collaborate with public agencies and property owners.

For the new parcels resulting from the alignment shift (ATC 13b), we will submit a written request to the Authority including an appraisal map that meets Authority standards, title report, any additional completed environmental approval documentation, a justification for the need, and drawings depicting proposed geometric designs, construction limits and cross-sections.

From there, we will begin with a kick-off meeting where we outline goals and expectations, define roles and responsibilities, and establish protocols and management processes. We continue to meet on an as-needed basis throughout the project to review status, discuss and resolve identified and anticipated issues, and plan for upcoming right-of-way acquisition activities.

We've Done It Before

Our right-of-way acquisition team has extensive experience collaborating with public agencies and property owners to expedite the acquisition process. Successes include:

- SH 130 Segments 5 and 6 – 320 parcels acquired within a 21-month schedule
- North Tarrant Express Segments 1 and 2 – 299 parcels acquired within 24 months, 65 percent of which were completed within 18 months
- North Tarrant Express Segment 3A – 102 parcels to be acquired, 65 percent were completed within 18 months; the remainder within 24 months

Expediting Right-of-way Acquisitions

PROVEN SUCCESS

On the SH 130 Segments 5 and 6 and North Tarrant Express Segments 1, 2 and 3A projects, Right-of-way Acquisition Manager Dennis Sedlachek, SR/WA, R/W-RAC, oversaw the acquisition of 721 parcels, all of which were completed in less than 22 months, enabling the construction schedule to be accelerated in most areas of the projects.





PROJECT EXAMPLES

Our team brings extensive experience minimizing acquisitions and impacts on private property, and collaborating with public agencies to resolve right-of-way challenges. Examples of our team's recent successes can be found throughout the text.

Right-of-way Delay Work-around Solution



I-635 LBJ EXPRESS

Shortly after the start of this project we determined that a delay in the acquisition of a parcel on the critical path threatened the project completion date. After developing options, supported by schedule calculations and work-around solutions, we implemented a cost-effective solution that provided for limited acceleration of an element of work and maintained the original project completion date.

1. SunnyGem

Our design has been carefully adapted to the SunnyGem property and their access requirements to the existing loading dock so truck movements are maintained and not affected by any structural elements. We meet the minimum clearance of 16.5 feet and using a U-section for the span allows us to lower the profile resulting in less fill and reduced visual impacts. This solution has the added benefit of enabling us to lower the profile of the McCombs Road structure, further reducing the amount of fill in that location. Our design also minimizes the time and construction operations impact to the facility.

During construction, we will minimize impacts to SunnyGem's ongoing operations and maintain safety by:

- Notifying SunnyGem in advance of upcoming construction work and temporary detours
- Using phased construction aimed at minimizing impacts
- Installing fencing to protect workers — ours and SunnyGem's
- Verifying signage is efficient and easily understood through daily inspections
- Soliciting feedback from SunnyGem to confirm access is maintained and to identify opportunities for improvement
- Planning disruptive work during off-peak hours whenever possible

COMMITMENT

We will meet with SunnyGem early in the design process to understand their operational needs. We can then create design and construction phasing plans that minimize impacts to their facility.





COMMITMENT

We will maintain access to the existing Amtrak platform at all times during construction.

California Railroad Experts

JMA Civil (SB) will provide railroad design and coordination for the BNSF Railway shoofly through downtown Wasco (ATC 2) and the main line realignment. Specialists in freight railroad design, they are currently designing three separate Union Pacific Railroad shooflies for Construction Package 1. For the Port of Stockton, JMA designed the new 20,000-foot rail yard for the benefit of BNSF Railway and Union Pacific Railroad that is currently under construction.



JMA Civil (SB) designed this new 20,000-foot rail yard at the Port of Stockton, California for use by BNSF Railway and Union Pacific Railroad.

2. City of Wasco Transit Station (Amtrak)

With the City of Wasco's agreement, we are removing the transit station building as it conflicts with the at-grade HSR alignment through Wasco (per ATC 2). We will work with the City of Wasco to develop a cost-effective design that meets their needs. It will include a ticket kiosk, restrooms and access to the Amtrak platform under the HSR tracks. The accessway will serve as a gateway to the City of Wasco — it will be aesthetically pleasing and have an open design with good lighting for added safety. The Amtrak platform will largely remain in its existing location with minor temporary reconfiguration during construction.



3. Certis Property

The alignment creates encroachment on the Certis Property, and we commit to supporting the Certis Property owner's efforts to relocate the affected portions of their business and to minimize impacts prior to the relocation as needed. Using applicable strategies identified in *Section 3.F – Minimizing Impacts to the Public*, we will ensure construction activities do not impact the facility's ongoing operations including providing safe access to the facility at all times.

4. BNSF Railway

The realignment of the main line will be constructed adjacent to the current BNSF Railway alignment, providing no impact to the railroad operations. We will deliver a completed roadbed so BNSF Railway can construct and cut-over the track for the new section. We will actively and systematically coordinate the approach and timing of this work, providing BNSF Railway with the required notification and construction window in our schedule.

For the shoofly through downtown Wasco required by ATC 2, we will work closely with BNSF Railway and other key stakeholders to secure the required approvals for the final design. Detailed considerations include:

- Establishing and refining the preferred shoofly alternative
- Discussing a temporary speed reduction in main line and siding operations for temporary track work
- Maintaining Wasco Coal Terminal operations and coordinating with Savage Services, the coal terminal operator
- Engaging Amtrak in discussions about their passenger platform
- Engaging the California Public Utilities Commission for the temporary at-grade crossings
- Planning the cut-over windows and construction procedures requiring a Form B track warrant from BNSF Railway





D. DESIGN CONFIGURATION MANAGEMENT AND QUALITY CONTROL

Quality is the result of well-conceived plans, diligent adherence to these plans and an uncompromising attitude. Highly experienced key managers (project manager, design manager, construction manager, quality manager and environmental manager, for example) have been involved in the development of our proposal, staffing and approach and will remain designated in their assignments throughout the project duration. This approach ensures that the team properly addresses critical components of the project from planning and design through construction. Our objectives for design quality include the following:

- Making quality a top priority by empowering all personnel to recommend a hold on design when needed
- Providing a design team that has experience with a mature, well-tested, and compliant ISO 9001:2008 quality process that eliminates rework by getting the job done right the first time
- Organizing and conducting quality management recognizing the unique roles that both quality assurance (QA) and quality control (QC) have in the design process

Our Design Quality Management Plan (DQMP) is fully aligned with the Authority's Quality Management Plan (QMP) and verification, validation and self-certification (V&V) procedures (see *Section 1.C –Master Quality Plan Approach and Commitment* and provides QA/QC for design, quality processes (including nonconformances), document control and auditing. QA/QC activities are stringently implemented to avoid mistakes, delays and rework. As shown in Figure 2-11, the core of our quality and environmental management system is "right first time delivery."

DESIGN DELIVERABLE PROCESS

The design manager will ensure that design engineers adopt a standard format and content to ensure consistency of information delivered to the design QC team, V&V team and the Authority. The work will be checked by competent individuals who did not participate in development of the original design, including the design manager, discipline managers environmental manager and others appointed by the design consultants.

Design Quality Assurance (QA) will be provided by Design Quality Assurance Manager (DQAM) Esteban Trigueros and Quality Manager Matilde Perttierra who will ensure compliance with the contract, perform QA reviews and audit the designers and the design QC team for adherence to the Authority's Master Quality Plan and our DQMP. Independent design reviews will be performed by the V&V design lead and the V&V manager (from an independent firm) who will verify compliance of the submittals and attach a V&V submittal (including certification, when applicable) to each deliverable as evidence

COMMITMENT

QUALITY PROGRAM

We are committed to meeting the Authority's quality-related goal and ensuring the project is designed and constructed to serve as a model of high quality for the entire system.

We've Done It Before

V&V Experience for HSR Projects

We performed verification, validation and self-certification for the following projects:

- Northwest HSR Corridor, Lalín (Xaxán – Anzo) Section
- Madrid – Extremadura HSR, Merida – Badajoz Section
- Levante HSR, Arcas del Villar – Fuentes Section
- Northwest HSR Corridor, Soto del Real to Segovia (Lot 4)

Figure 2-11: Quality and Environmental Management System





that the design submittal meets the technical contract requirements. A schedule of design deliverables will be available, updated and provided to the Authority through the RM Tool DOORS 9.x.

COMMITMENT

SUBMITTAL ACCURACY AND COMPLETENESS

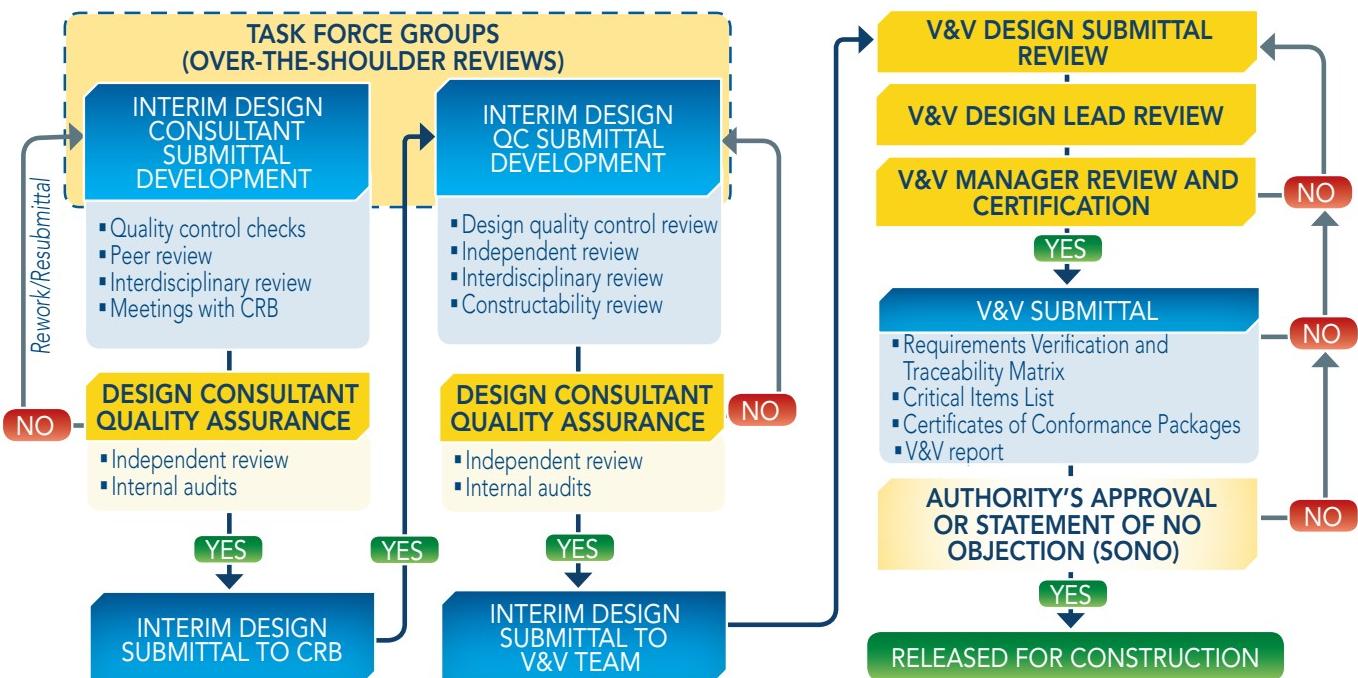
A double QA/QC review process performed by the designers and our in-house quality team will ensure the quality, accuracy and completeness of every submittal. This quality process will be fully and seamlessly integrated with the V&V process, ensuring consistency with the Authority QMP and V&V procedures. All QA/QC documents generated during this process will be also part of each submittal.

CONSULTANTS' QUALITY PROGRAMS

Design consultants and subconsultants will use their independent management procedures and quality programs for their own work. The designers' quality programs must comply with the Authority QMP and V&V procedures, our quality management system and project management plan. The designers' quality programs will be attached to our DQMP and will be audited to ensure accuracy and compliance with the contract. Every document and deliverable produced and submitted by the design consultants must be checked by a quality system that maintains independence between QA and QC.

Each design consultant quality manager will provide QA including developing, implementing, managing, maintaining, auditing and documenting the designers' internal quality program and adapting it to comply with contractual requirements and our DQMP. The design consultant will amend, correct and document any deviation detected by our design QC team, QA team, V&V team or the Authority during an audit or following a revision, and provide resolution action to any nonconformance report (NCR) or corrective action report (CAR).

Figure 2-12: Design Quality Management Process





QUALITY MONITORING BY CALIFORNIA RAIL BUILDERS

Design Manager Ignacio Navarro and our design-build integration team review and manage the designers' performance during regular progress meetings and reviews. They will check that the design work complies with the contract requirements, approved design schedule and our DQMP.

Ignacio will also coordinate interdisciplinary reviews such as consulting with the environmental compliance manager to ensure that environmental permits, issues and commitments are incorporated and carried forward into design. Formal interdisciplinary reviews by the design manager or his designee will verify that both the Authority's and our own quality programs are being followed. The quality manager will perform audits to ensure that the design team and design consultant processes adhere to the Authority's requirements.

VERIFYING TECHNICAL CONTRACT REQUIREMENTS

The V&V design lead will verify technical contract requirements for each design submittal item. The V&V plan will describe the steps to be taken for this process including the:

- Verification acceptance criteria
- Argument narrative (describes how the criteria is met)
- Endorsed evidence
- Protocol for internal verification
- Requirement for the V&V team and sign-off
- CRB self-certification

1. Qualifications, Role and Responsibilities of V&V Manager

V&V Manager Lee Dumas, PE, brings more than 25 years of experience in transportation, heavy and light rail transit system design and construction, including 10 years with Caltrans. He has provided design, construction and program management services for transportation agencies throughout the U.S. including rail projects for Amtrak, the Metropolitan Atlanta Rapid Transit Authority and the Los Angeles County Metropolitan Transportation Authority. He specializes in design and construction of light and heavy rail aerial structures, freight rail grade separations and main line track work. His experience and expertise encompasses conceptual and final design validation, project interface analysis, system integration, testing and start-up.

ROLES AND RESPONSIBILITIES

As shown in Figure 1-1 on page 8, our independent verification and validation team (Unico Engineering, Inc. a disadvantaged business enterprise) is part of our quality team and will provide the V&V manager, V&V design lead, V&V inspection and testing lead, and oversee

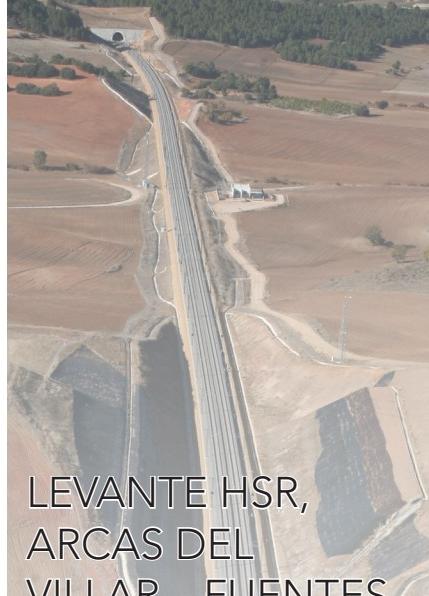
Effective Quality Approach											
	LEVANTE HSR, ARCAS DEL VILLAR – FUENTES SECTION										
Ferrovial Agroman's ISO 9001-compliant quality management system ensured quality in all project phases. In coordination with an independent consultant, a rigorous quality program using self-certification, verification and validation that complied with ISO quality criteria was used. This included laboratory testing, constant monitoring, fulfillment of established requirements and quality reviews by an independent engineering team.											
Figure 2-13: Verification and Validation Team Full-Time Equivalents											
<table border="1"><thead><tr><th>FTEs</th><th>Team/Position</th></tr></thead><tbody><tr><td>1</td><td>V&V Manager</td></tr><tr><td>2</td><td>V&V Design Lead V&V Inspection and Testing Lead</td></tr><tr><td>3</td><td>Verification and Validation Staff</td></tr><tr><td>6</td><td>Total</td></tr></tbody></table>		FTEs	Team/Position	1	V&V Manager	2	V&V Design Lead V&V Inspection and Testing Lead	3	Verification and Validation Staff	6	Total
FTEs	Team/Position										
1	V&V Manager										
2	V&V Design Lead V&V Inspection and Testing Lead										
3	Verification and Validation Staff										
6	Total										





Figure 2-14: V&V Manager Responsibilities

Our V&V manager will:
■ Develop the V&V plan
■ Coordinate with V&V team, quality manager, DQAM and CQAM
■ Provide V&V submittals (RVTM, CIL, CCPs) included and V&V report
■ Verify design changes
■ Oversee the requirements management process (RM tool)
■ Implement the change control and configuration management process
■ Oversee V&V inspection and testing

Corporate Culture of Continuous Improvement

Train. Do. Audit. Refine. Annually, every operation is required to establish quality objectives that improve delivery of our final product — safely and with high quality. The benefit to the owner is a continuous improvement process established at the foundational level of the company that results in ongoing service improvements throughout the life of the contract.

the inspection staff and RM DOORS specialist. Early coordination with the various stakeholders involved in the final certification of the project is emphasized. The V&V team has authority to stop any design/construction deliverable to be submitted to the Authority if the contents or scope do not fulfill the required technical and non-technical contract requirements. Figure 2-14 delineates the V&V manager responsibilities.

DESIGN CHANGES MANAGEMENT

Our change management process describes how changes to the technical contract requirements baseline will be managed and is based on ISO/IEC 1007 *Quality Management Systems – Guidelines for Configuration Management*. The change management process will also consider our established project goals and contract limitations/thresholds for conducting changes.

A DQMP written procedure will handle design changes. Written requests for design changes may originate from the Authority, internal or external design organizations, field personnel, regulatory or government bodies. Field communications in the form of requests for information or field change requests to the designers will come through the construction manager and design manager.

When the Authority directs a change in the scope of the work, a change order document is prepared. Changes to the technical requirements will be added to and managed in DOORS. Changes to drawings or specifications already issued for construction, when re-issued, are noted as revisions on the altered document. The design manager will work with the V&V manager to ensure that the revised document is traced to the RVTM and undergoes the same design QC processing as the original design. Once approved by the Authority, the changes are provided to all holders of affected documents. A log of approved design changes will be maintained in DOORS.

Changes to the technical requirements baseline will be managed by the V&V inspection and testing lead, who will, in conjunction with the V&V design lead, track changes with the RM tool.

The V&V design lead and V&V inspection and testing lead will provide guidance for what is defined as a change. Change definitions or guidance criteria will be established for various elements of the project including contract requirements, design elements, construction operations, testing procedures and acceptance criteria, etc. Controls and procedures for approval of changes will also be established by the V&V inspection and testing lead following guidelines established by the Authority's contract documents. The change management process will ensure contract integrity and will conform to the Authority's requirements.

Meeting Safety/Security Design Criteria

COSTA DEL SOL RAIL CORRIDOR, ESTEPONA SECTION

Euroestudios' safety systems design was incorporated into the infrastructure of the project. Safety technology included ERTMS/ETCS level 2 system signaling equipment and trackway that accommodates HSR, commuter rail and urban rail trains.





MEETING SAFETY AND SECURITY DESIGN CRITERIA

To ensure the safety and security criteria are met from design to final project completion, we will apply *Section 26.3 – Safety and Security Certification Program* of the Authority's design criteria and *Section 54.4 – VV&SC Procedures* of the contract general provisions. We will proactively design for safety and security by using the following techniques:

- Preventing, minimizing and managing risks at the source during design stage, design changes and construction phase
- Planning layout for the project site and staging with security in mind to prevent unauthorized access and intrusion
- Installing barriers and security fencing to prevent train-to-train, train-to-vehicle, train-to-pedestrian, and/or train-to-animal conflicts
- Maintaining wildlife movement corridors that avoid safety risks by designing wildlife corridor undercrossings, wildlife fencing and wildlife artificial dens

Our approach to supporting the safety and security certification program (described in *Section 3.C – Safety and Security*) will be to apply the V&V procedures. We will compile and submit safety and certification packages at final design and construction for all elements on the certifiable items list (CIL) upon completion of each element or infrastructure component.

2. Method for Reviewing and Addressing Design Development

Figure 2-12 on page 45 illustrates our approach to reviewing and addressing design development. The final self-certification will confirm compliance with all technical contract requirements and critical items.

PROJECT EXAMPLES

Examples that illustrate our experience implementing verification, validation and self-certification processes and procedures on large infrastructure projects are provided throughout the text.

We've Done It Before

Quality Awards. As evidence of our commitment to excellence and quality, we offer a sampling of the awards and recognitions received by our team:

I-635 LBJ Express. For its outstanding efforts in maintaining environmental protection and standards throughout each phase of construction, the I-635 LBJ Express project was honored by the American Road & Transportation Builders Association Transportation Development Foundation with a Globe Award in 2013.

North Tarrant Express Segments 1 and 2. In 2014, the project team received American Road & Transportation Builders Association Transportation Development Foundation's Globe Awards for setting the standard for excellence in construction environmental compliance in the category of major highway.

Design Quality Success

NORTH TARRANT EXPRESS SEGMENT 3A

For this \$650 million project, OTHON's design team was audited quarterly by the owner's independent engineer. The independent engineer met with management and design staff, and confirmed compliance with the design quality management plan. The team received high marks for quality tracking, reviews and approvals which were managed electronically using ProjectWise.

NORTH TARRANT EXPRESS SEGMENTS 1 AND 2

We have implemented V&V and self-certification processes and procedures on many projects including this 13-mile, \$1.45 billion design-build project that rebuilt one of the busiest corridors in Northeast Tarrant County. The project scope included 70 bridges totaling more than 3.8 million square feet of deck area; more than 2.6 million square feet of retaining walls; and nearly 8 million cubic yards of earthwork.





COMMITMENT

FULL PROGRAM IMPLEMENTATION

We will establish an environmental management system based on ISO 14001:2004 that results in full compliance with the environmental commitments in the contract.

Mitigation by Design

The most effective and efficient way to minimize environmental impacts in a sensitive area (ecological, noise, traffic or aesthetic) is by not disturbing it. Therefore, where practicable, we will adjust the alignment to avoid or reduce exposure to sensitive areas. For example:

- Our ATC 11 that reverses the stacking of several of the HSR and county cross roads allows the existing roadside ditch drainages to remain in their existing configuration thus preserving existing flows
- Our selection of the ditch intrusion barrier (where possible) balances earthwork, reduces traffic, provides additional stormwater drainage and storage and reduces the visual impacts of the HSR infrastructure

E. ENVIRONMENTAL COMPLIANCE

We prioritize sustainability, respect for the environment and quality. Based on a review and evaluation of the environmental documents, we anticipate limited environmental issues. We will use our ISO 14001:2004-compliant environmental management system (*Section 3.D – Environmental Approach and Staffing*) to ensure we meet all commitments.

1. Meeting Environmental Requirements

Our approach to supporting each environmental mitigation concern, including those of the Authority, local, state and federal partners, and other regulatory agencies (plus requirements that arise during project implementation) includes staying focused, training and making compliance a personal commitment.

ENVIRONMENTAL COMPLIANCE PLAN

We will develop and submit the draft environmental compliance plan (ECP) for Authority approval within 60 days of notice to proceed. It will demonstrate how we will integrate environmental compliance with all environmental requirements into all phases of the project in accordance with the contract documents. Construction will start after Authority approval of the final ECP. An interim ECP will be prepared to cover field investigation activities (such as geotechnical investigations and surveys) that occur prior to approval of the final ECP.

The ECP details the environmental footprint and environmental requirements, compliance monitoring and reporting, communications protocol and environmental training during design, construction and post construction. Our environmental compliance objectives include:

- Design environmental compliance into our documents, the environmental team verifying at each phase that commitments and avoidance, minimization and mitigation measures are properly incorporated and addressed
- Deliver documented environmental compliance in the field, achieving successful project milestone deliveries using the Authority's web portal Environmental Mitigation Management and Assessment (EMMA)
- Maintain professional relationships with regulatory (permit) authorities by understanding what they need to do their job and creating a collaborative environment for resolution of their concerns

The design process will be iterative, balancing transportation needs with environmental sensitivity, cost and schedule. At each step, we will review the design for environmental compliance and sustainability. The value of this exercise, even though evaluations have already been made with the NEPA/CEQA process, is to assure the Authority that optimum options are selected, and to assure the public and stakeholders their concerns have been seriously evaluated with up-to-the-minute information.





Our approach responds to these key environmental concerns:

- Establishing 41 wildlife crossings (10 feet by 3 feet) and placing 32,000 linear feet of wildlife fencing
- Preserving biological, cultural and archeological resources
- Minimizing construction impacts to stormwater quality, air quality and waters of the U.S.
- Limiting construction activities within certain hours to reduce noise

ENVIRONMENTAL CONDITIONS KNOWLEDGE TRANSFER

Within 60 days of notice to proceed, we will plan a knowledge transfer workshop to fully understand the institutional and baseline knowledge regarding the environmental materials, commitments and resources.

We will also coordinate special-topic workshops with the Authority and permitting and regulatory agencies to discuss aesthetic, cultural, archeological and environmental mitigation topics. Before the meetings, we will develop compliance checklists and visual explanations for options selected. Our goal is to fully understand the data and requirements and seamlessly pick up the responsibility for the environmental compliance.

ECOLOGICAL SURVEYS

Critical for planning construction, the habitat assessment level surveys under the interim environmental compliance plan (IECP) will confirm assumptions and determine whether protocol presence/absence surveys are needed in addition to preconstruction surveys. Presence/absence surveys take longer than preconstruction surveys and may postpone construction in areas with habitat that is inviting to certain species (for example, up to six months for blunt-nosed leopard lizard). Habitat assessments will also consider jurisdictional waters or refinement of the existing delineation. Surveys include:

- **Preconstruction Species Surveys** – Conducted within the potential impact radius and regulatory time frame for each species (typically within 30 days of construction for burrowing owl or within one week for migratory nesting birds, raptors and white-tailed kite)
- **Anticipated Presence/Absence-constructions Surveys** – Conducted during the primary activity season of the species in the few segments that have potential habitat (mostly from Wasco north)
- **Additional Nesting Bird Surveys** – Conducted during nesting bird season from February to August throughout the entire alignment
- **Fairy Shrimp Surveys** – Dry season collection of soils with potential to host fairy shrimp cysts will be conducted for vernal pools between Shuster Road and Woollomes Avenue and northwest of Garces Highway

Poso Creek Design Mitigates Impact to Waters of the U.S.

Our design for crossing Poso Creek avoids placing a column within the wetlands limits.



Figure 2-15: 180-Day Action Plan

First 180 Days

By 60 Days

- Plan, coordinate and attend a knowledge transfer workshop with the Authority
- Fully define environmental compliance work plan, schedule and monthly report forms and process — ready for Authority review and approval

By 90 Days

- Permits will be defined and submitted for approval by regulatory agency
- Regular meetings will be held to manage permit revisions and agency approval

By 180 Days

- Mitigation measures, best management practices and permit requirements organized by design component, type of construction activity and location
- Process tracking spreadsheets covering federal, state and local compliance and permitting processes developed and maintained throughout the project





We've Done It Before

Our environmental team member MARRS Services (DBE) conducted surveys and managed environmental compliance for the major regulators in California including EPA Region 9, DTSC, RWQCB Regions 5 – 9, State and Federal Fish and Wildlife, and the air quality boards.

Advanced Hazardous Materials Assessments

We assessed in detail the hazardous materials information provided by the Authority. We supplemented this information with a visual survey conducted by Kevin O'Malley, vice president of Asbestos Service, Inc., a Bakersfield-based asbestos and lead abatement firm. Based on his visual assessment, he estimated the volume of Class I and Class II waste for disposal. See Figure 2-16 for an excerpt from the report.

BIOLOGICAL RESOURCES

As part of the habitat assessment under the IECP, biologists will stake, fence and/or flag environmentally sensitive areas (ESA) and environmentally restricted areas (ERA). Major buffer requirements between construction and sensitive resources include:

- **Blunt-nosed Leopard Lizard** – Because handling, harassment nor relocation is permitted, during final design, qualified biologists will set up escape routes for passive relocation and certify that the species is absent before construction work in the area
- **Small Mammal Relocation** – If indicated by habitat assessments
- **Mitigation** – Biologists will implement three plans — a restoration and revegetation plan for upland habitats; a weed control plan for all habitats; and a salvage, relocation and/or propagation of special-status plant species plan

We will subcontract biologists, approved by the Authority and with current permits from the respective regulatory agencies, to conduct species relocation when handling or harassment is a concern. However, every effort will be made in preliminary habitat assessments and preconstruction surveys to create ESAs and ERAs that adequately protect sensitive species and prevent circumstances that require handling or removal.

HAZARDOUS MATERIALS

Overall, proactive management is the best way to control costs associated with known hazardous materials sites. Because these activities affect design and execution of subsequent tasks in areas of concern, we will conduct early ground survey, testing and soil borings in the areas of known contaminants to determine the nature and boundaries of the debris. By designing to avoid known recognized environmental concerns if practicable (e.g., Copeland Property, 541 Highway 46) and training our team in hazard identification protocols, we will reduce the probability for hazardous materials management in the field.

Figure 2-16: Excerpt from Hazardous Materials Survey Report

Item	Location	Facility Description	Approximate Age	Estimated Class I (T)	Estimated Class II (T)	Useable Concrete & Asphalt	Aerial Image
5	4 th street and BNSF alignment Sta. 5568+00	Building on North side of 4 th Approximately 65' x 110'	2000's	0	0	Asphalt plus street asphalt	
6	4 th street and BNSF alignment Sta. 5570+00	Building on South side of 4 th Approximately 75' x 110'	1940's	60	10	assuming Lead in Soil >100 ppm top 3 inches	





Where avoidance is not possible, we will proactively identify areas of known hazardous materials using the existing GEOTRACKER area of concern and area of interest information, training workers about these areas, sampling and profiling the in-situ “waste” and arranging manifests and transportation in advance of possible excavation to maintain construction schedules.

CULTURAL AND ARCHAEOLOGY

The EIR/EIS identifies cultural and archeological mitigations as a less significant concern; the experts anticipate no discoveries. Nevertheless, we will conduct surveys and investigations to comply with the National Historic Preservation Act of 1966, Section 106, and develop mitigation and compliance plans to document steps taken to protect cultural resources (present or not). During construction, our environmental team will monitor the carefully planned construction activities. Should something of significance be observed, it will be reported to the Authority, Native American tribe representatives and other authorities and work will cease until the discovery can be evaluated and protocols for proceeding approved.

NOISE, AIR AND WATER QUALITY

In conjunction with our ATC 2 analysis, we conducted a noise study that indicates no significant change in noise levels as compared to the viaduct solution and also provided several improvements. (See page 37-38). *Section 3.D – Environmental Approach and Staffing* discusses mitigation of impacts from construction.

TRANSPORTATION

Detailed in *Section 3.F – Minimizing Impacts to the Public*, our design, ATCs and approved Traffic Management Plan will reduce the “cone zone” construction period, minimize community impacts, keep traffic flowing safely and preserve main line speeds for BNSF Railway operations.

2. Additional Environmental Work

We will perform any additional work necessary to revise, supplement, or amend final environmental documents or governmental approvals to remain in compliance with all laws. We reviewed the potential impact from permits that have not been received by the Authority to evaluate their potential impact on the project and schedule. The only permit identified as a high risk is the Section 404 permit. We will assist the Authority and the U.S. Army Corps of Engineers to secure this permit as expediently as possible.

For ATCs 2, 11 and 13b, where environmental re-evaluation is required, we will obtain Authority approval as described in the three-step environmental re-examination process shown in Figure 2-17 on the next page.

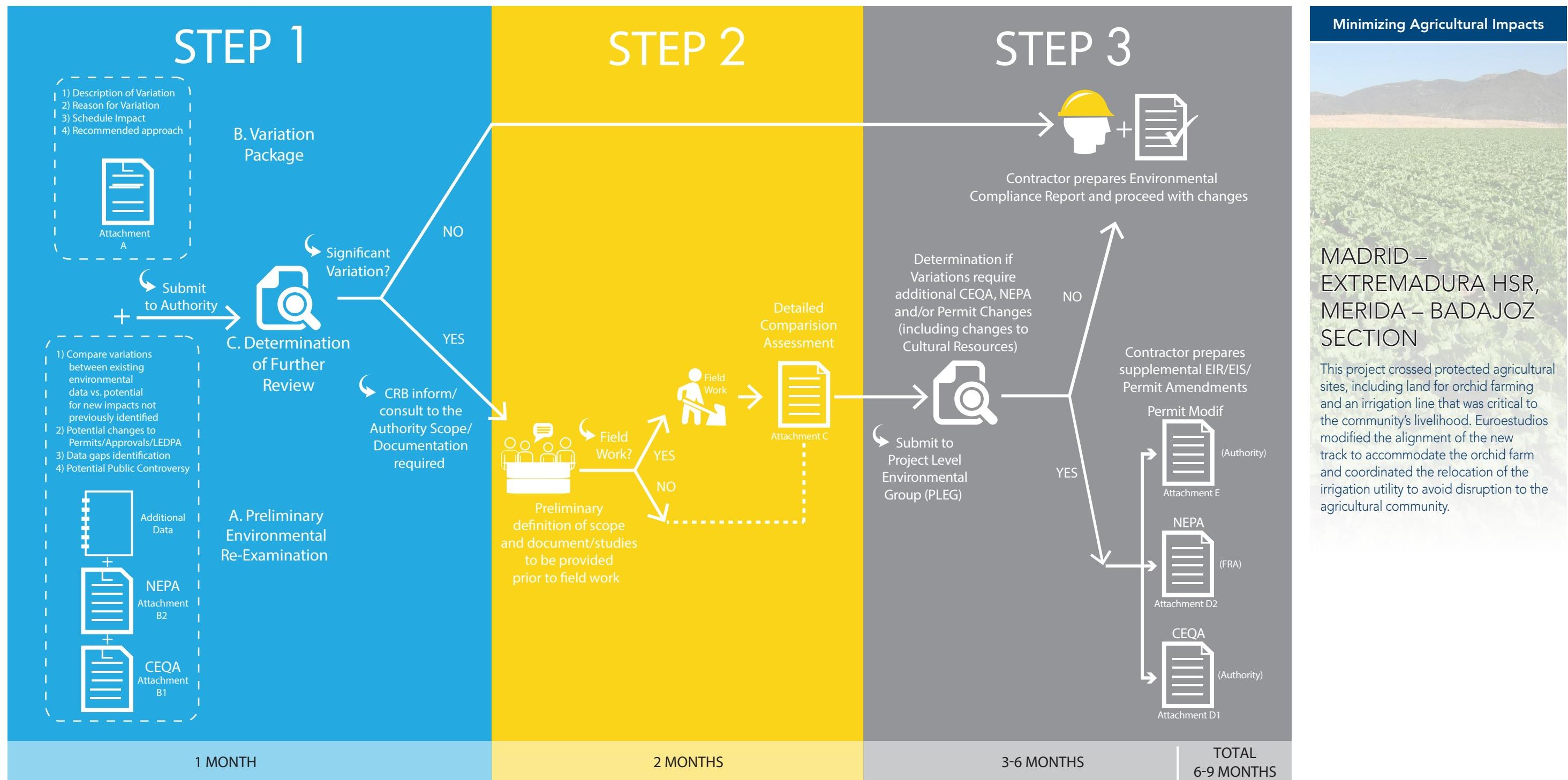
Noise Compliance

Our specifications will require compliance with section 17.68.090 of the City of Wasco municipal code that prohibits noise above 55dB(A) from 7:00 a.m. to 10:00 p.m. and 50dB(A) from 10:00 p.m. to 7:00 a.m. at the property line of sensitive receptors. Our construction teams will regularly monitor noise levels and promptly respond to complaints.





Figure 2-17: Three-step Re-examination Approach



SECTION 3 |

CONSTRUCTION AND CONSTRUCTION OVERSIGHT



CALIFORNIA HIGH-SPEED RAIL PROJECT

Design-Build Contract for
CONSTRUCTION PACKAGE 4

Proposal | RFP Number: HSR 14-32





TECHNICAL PROPOSAL

3. Construction and Construction Oversight

Our team's comprehensive construction approach is focused on meeting the Authority's schedule goal while minimizing impacts to residents, the agricultural community, irrigation systems, property owners such as SunnyGem and Certis, and BNSF Railway and Amtrak operations. Our proven construction verification, validation and self-certification (V&V) and environmental management system processes will confirm we are providing a quality project that meets the Authority's commitments and expectations. Always promoting safety and security of persons and property, our fast-tracked approach features:

- Field mobilization that starts well in advance of the completion of the first design packages
- Multiple crews working in parallel
- Plans and strategies in place for responding to items that could impact the schedule such as right-of-way acquisition, utility relocation and agency approval delays
- Effective resource management that anticipates potential labor and material shortages and plans in place to mitigate impacts

Accommodating Unanticipated Conditions



NORTHWEST HSR CORRIDOR, BAXÁN – ANZO SECTION

After this project was awarded to Ferrovial Agroman, several different site conditions were encountered. The team applied its extensive HSR design and construction experience to develop design adjustments and alternative construction solutions that made the project viable. Examples include:

- Changing the vertical alignment due to extensive archeological findings
- Modification of Bendoiro tunnel from cut-and-cover to a bored tunnel
- Modification in the viaduct construction method
- Developing new disposal areas to reduce the impact of material hauling
- Adoption of different seeding species that were more similar to the local species but with better fire resistance
- Changes in tunnel support, lining and section





COMMITMENT

We will keep the Amtrak platform accessible during construction.

We will maintain BNSF Railway's access to the Wasco Coal Terminal.

We will secure all California Public Utilities Commission approvals prior to start of construction.

It can often be a challenge for suppliers to transport materials beyond their normal capacity. We can mitigate this by purchasing trailers and other transport vehicles to supplement their fleet.

The North Tarrant Express Segments 1 and 2 project earned an "Under Budget" award for cost-saving and project efficiency efforts from America's Transportation Awards for the Western Region States.

A. MANAGEMENT AND ORGANIZATION APPROACH AND COMMITMENTS

Dividing the project into two segments enables our team to manage each segment as a project within Construction Package 4. Each segment will have its own management team including a segment manager, design lead, safety lead, quality lead as well as a scheduler, field engineers, superintendents and foremen. The segment managers will report to Construction Manager Pablo Molla.

ENSURING TIMELY SUBSTANTIAL COMPLETION

We commit to meeting the Authority's goal for completion of this project in accordance with the schedule requirements of the Federal Railroad Administration (FRA) and American Recovery and Reinvestment Act of 2009 grant/cooperative agreements. In anticipation of meeting this goal, our initial schedule shows substantial completion of construction on April 10, 2019, and final acceptance of completion June 13, 2019.

To achieve construction by this date, we divided the project into two segments, allowing our design and construction teams, while integrated, to act independently and move forward with their respective segments. Our plan is to start within each segment simultaneously. Our plan includes a phased approach for each segment through completion of final design, allowing work to fast track, with earlier activities to start in the field prior to completion of all design work. In the field, parallel crews will be working on the embankment and multiple grade separations concurrently. We will issue a demolition and site-clearing package, a foundation-only structural package and a final structure package for each structure, and we will have up to seven different structure crews working simultaneously.

Figure 3-1 on the next page provides additional examples of other techniques we will use to achieve schedule.

ACCOMMODATING THIRD-PARTY DELAYS OR UNANTICIPATED CONDITIONS

Our approach includes being flexible and agile throughout construction. In addition to continually evaluating and reassessing our plan to be as efficient as possible, we are skilled at responding to changed conditions and developing work-around solutions that mitigate schedule impacts. Understanding that, despite proactive management on our part, items such as acquisitions, utility owner-managed relocations and agency approvals have the potential to be delayed, we are continuously looking for alternative options and opportunities to improve the plan. Should delays occur, strategies we may implement include:

- Working multiple shifts



**Figure 3-1:** Expediting Construction and Achieving Timely Substantial Completion

Element	Strategy
Earthwork	Due to the extensive amount of embankment, having suitable fill material available for construction will be critical to maintain schedule. The project map (Figure 1-1 on page 8) shows two borrow sites we have identified — at the Semitropic Water Storage District and Cawelo recharge basins. There are others we expect will be able to provide suitable fill material, and we will also recover material from ponds and ditch cuts.
Right-of-way Availability	Our construction plan is tailored to the Authority's right-of-way availability schedule, and Right-of-way Acquisition Manager Dennis Sedlachek will provide proactive coordination between the Authority and our construction manager and segment managers to facilitate a coordinated construction plan that efficiently considers right-of-way availability.
Early Utility Relocations	To jump start this schedule-critical work, we have developed a "First 100 Days Plan" that includes: <ul style="list-style-type: none">■ Conduct task force group workshops and one-on-one meetings with utility owners and other stakeholders■ Obtain as-built/record drawings from all utility owners to refine preliminary utility information■ Preparing potholing plans and performing field verification and land surveying at critical conflicts■ Coordinating all positive location requirements■ Providing costs and schedules for facilities to be relocated and assisting with liability determination■ Preparing notices to owners, individual utility task agreements and encroachment permits■ Assisting with encroachment exception requests, approval of utility task agreements, high-/low-risk policy exceptions, FHWA request for authorization packages, right-of-way data sheets and certification documents
Construction Sequencing	Construction sequencing strategies that will facilitate achieving the completion date include: <ul style="list-style-type: none">■ Dividing the work into smaller design packages expedites final design/approval resulting in early construction start dates■ Sub-dividing design into a demolition and grading package, a foundation-only package and a balance of structures package■ Developing smaller construction packages based on work types will allow for the use of multiple subcontractors and crews in various segments of the job and facilitated similar work types to be performed concurrently in all segments while allowing maximum flexibility to work around right-of-way acquisitions■ Assigning two crews to fast-track construction of the underpasses at Poso Avenue and Sixth Street
Environmental Constraints	Our schedule anticipates and manages potential impacts from environmental constraints such as: <ul style="list-style-type: none">■ Establishing a detailed construction transportation plan (prior to the start of construction) that addresses routing and delivery schedules to prevent mid-construction complaints and potential work stoppages■ Considering restricted construction hours, noise generation and traffic related impacts to the public■ Managing environmental and hazardous materials identification, management and remediation activities■ Conducting surveys, delineating environmentally restricted and sensitive areas, and inspecting for compliance
Seasonal Constraints	Tule fog is a unique weather constraint in the Central Valley that occurs from November to March each year. This seasonal weather phenomenon creates a driving hazard along the highways as limited visibility leads to serious chain reaction collisions. For the construction project this could impact round trip transit time for earthwork, aggregate and concrete. On site, the fog could affect hoisting sight lines and require more coordination on the ground. Harvest season requires extensive coordination with growers and farmers. We will jump-start the coordination effort during the nearly one-year design, permitting and approval process period. We will work with growers and farmers to understand how they enter/exit their land, how the crops and orchards are laid out in relation to the HSR alignment, how the fields drain and what special measures are required for the different crops. We will work with growers and farmers to enable as many harvests as possible before removing vineyards and trees.
Proactive Supplier Coordination	Performing accurate material quantity take-offs and associating those quantities with the work schedule will provide an accurate understanding about what materials will be needed when. We will work closely with suppliers to schedule advanced production. Strategies include providing requirements schedules, encouraging fabrication of materials during slow times and purchasing extra trailers for suppliers (such as steel suppliers) so they can transport materials to the job site at their convenience. Supplies will be purchased from multiple firms to prevent sudden or discretionary price increases. We will foster relationships with multiple suppliers and engage suppliers during design to help define details required for pricing. This approach will also allow suppliers to better understand the project, plan their resources and mitigate potential price increases.





With more than 100 years of experience, Griffith regularly resolves drainage, flood control and water conveyance issues in the area. Their experience working with stakeholders on these issues will be a valuable asset in addressing water conveyance challenges along the Construction Package 4 alignment.

COMMITMENT

V&V IMPLEMENTATION

We will confirm the installed infrastructure meets the Authority's intended purpose using our formal V&V process.

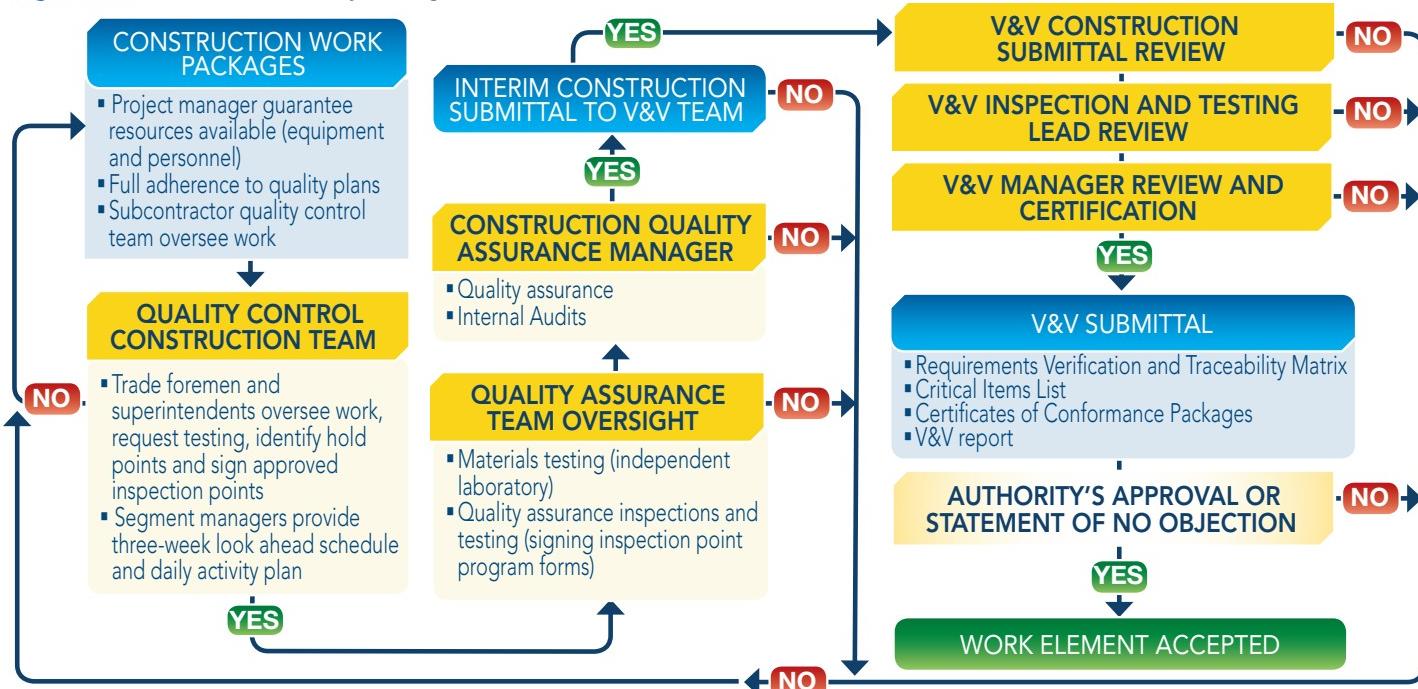
- Identifying multiple sources of materials such as primary and back-up supplies of concrete and aggregates
- Establishing partnerships with key subcontractors, suppliers and third parties to keep this project a priority
- Adding additional subcontractors when required to recover schedule or accomplish work-around solutions
- Diligently pursuing near-critical and non-critical elements of work to minimize the potential of additional critical paths

EFFECTIVE CONSTRUCTION QUALITY MANAGEMENT

Construction quality begins with a thorough understanding of the project requirements. We will hold pre-activity meetings for every major task to make sure that attendees (our teams, subcontractors and Authority representatives) completely understand the requirements to match the Authority's expectations. Pre-activity meetings also cover safety, environmental, release for construction documents, materials testing and sampling, inclement weather plans and inspection witness/hold points. Our task force groups will hold periodic meetings to coordinate our work internally and with the Authority, cities of Wasco and Shafter, Caltrans, utility companies, BNSF Railway, Amtrak and other third parties.

Using the process shown in Figure 3-2, full-time inspectors, testing technicians and a certified laboratory will perform sampling, testing, inspection and monitoring; field tablets will be used for documentation. Design engineers will verify that construction complies with the design intent. To perform verification on each requirement, we will use the four basic techniques — inspection, testing, acceptance and analysis.

Figure 3-2: Construction Quality Management Process





CONSTRUCTION VERIFICATION AND VALIDATION. V&V will be executed through formal review processes, material submittal processes, approval processes, preparatory meetings, initial inspections, witness/hold point inspections, testing, surveillance, witnessing, work-in-place inspections and audits (Figure 3-3). Before construction, all proposed construction materials will be formally submitted, reviewed and approved.

Field-level testing will be executed as scheduled/required, with test results properly documented and reported in accordance with the V&V plan. Field communications (requests for information and field change requests) will be documented in the Requirements Verification and Traceability Matrix (RVTM) to ensure resolution, traceability and documentation.

The objective of construction validation is to confirm that the installed infrastructure meets the users' needs (end users and their proxies) and is effective in meeting its intended purpose. We will update the V&V plan as necessary and will develop procedures, validate the infrastructure, and document validation results (documenting issues/shortcomings) including any recommendations or corrective actions.

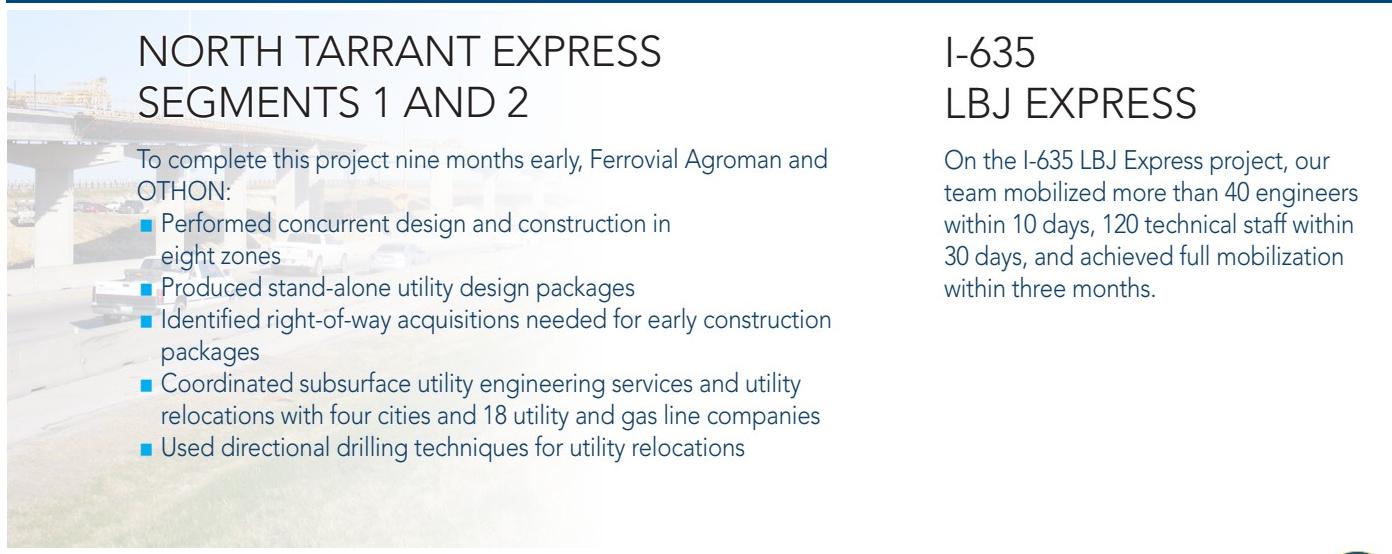
PROJECT EXAMPLES

Examples that illustrate our team's track record for achieving timely project completion, and methods for maintaining flexibility to accommodate third-party delays and unanticipated conditions are provided throughout the text.

1. Mobilization Staffing Levels

Mobilization of staff for construction will begin with the key personnel shown on our organization chart (Figure 1-1 on page 8). Our human resources team will also be mobilized — they will begin assembling the remaining required staff from our completing projects and hiring new local employees.

Ensuring Timely Completion



NORTH TARRANT EXPRESS SEGMENTS 1 AND 2

To complete this project nine months early, Ferrovial Agroman and OTHON:

- Performed concurrent design and construction in eight zones
- Produced stand-alone utility design packages
- Identified right-of-way acquisitions needed for early construction packages
- Coordinated subsurface utility engineering services and utility relocations with four cities and 18 utility and gas line companies
- Used directional drilling techniques for utility relocations

I-635 LBJ EXPRESS

On the I-635 LBJ Express project, our team mobilized more than 40 engineers within 10 days, 120 technical staff within 30 days, and achieved full mobilization within three months.





We've Done It Before

The Caltrans SR-134/Olive and Pass project required extensive coordination with the City of Burbank and other local stakeholders. The project was directly adjacent to the City's media center where NBC, ABC, Disney and Warner Brothers all have active production studios which are extremely sensitive to sound, vibration, dust and traffic. Griffith worked closely with the City business liaison to ensure businesses were not impacted. This proactive approach to earned the team Caltrans' Gold Level Excellence in Partnering Award.

CONSTRUCTION STAFFING (MANAGEMENT)

The construction staffing effort, led by Project Manager/Director Alvaro Gomez-Muro, will be managed by our human resources group established at the project site. Our construction manager and segment managers will be among the first on site. The segment managers will be responsible for construction within a geographical area and will manage the third-party participant relationships, in concert with the public relations group, within the segment. The segment managers will work with our managers in charge of specific disciplines such as earthwork, utilities, structures, environmental and safety. These managers are experts within their disciplines and will be responsible for delivery of the work including subcontractors, workers and equipment. Segment managers and superintendents will have a team including project engineers, assistant superintendents and support staff to facilitate completing their scopes of work. Our segment managers and many of our project management team members who will be relocated are currently completing work on other projects and will be available as this project begins. Most of our project engineers and support staff members will be hired locally. We estimate this project will require 30 to 40 construction management employees.

ADMINISTRATIVE STAFFING (MANAGEMENT)

Administrative staff consists of the human resources, business office, project controls and procurement staff. The leaders of these groups are all currently employed on other projects or within the corporate staff and will be relocated when the project begins. The staffing of these groups will fluctuate depending on the level of effort occurring. We have successfully cross trained staff to be multi-disciplinary allowing project staff to perform in multiple roles, assuring that work load demands can be met and continuity is maintained. We estimate the administrative staff will include approximately 20 to 25 people.

2. Long-lead Materials

Long-lead items include rail materials such as ties and rail for the BNSF Railway shoofly as well as precast beams, precast mechanically stabilized earth wall panels, and crushing and stockpiling aggregate materials. Other possible long-lead items include electrical cable, rebar and epoxy and equipment that the utilities may not have on hand. Certain custom pipe sizes and types for utility relocates may have long-lead times or require specific forward planning, especially given the Buy America requirements.

We included these schedule-critical items in our schedule. Our materials procurement task force will identify and order these items and we will stockpile materials as appropriate. We will track and manage all advance purchases in a Microsoft Excel spreadsheet in conjunction with the four-week look-ahead schedule, identifying material needs and potential shortages before they impact construction. During construction, the Excel tracker tool is used by field personnel to monitor and coordinate receipt of material.





3. Other Project Commitments

Our team has more than enough capacity for both the design and construction effort on Construction Package 4. While we do have other large projects valued at more than \$100 million, several of those projects are completing just as this project ramps up. For example, because Ferrovial Agroman just completed North Tarrant Express Segments 1 and 2 and the I-635 LBJ Express projects, we have a proven team immediately available. Those individuals have been key participants in developing this proposal and our design, and will hit the ground running.

Figure 3-4: Other Project Commitments

Project	Value	Contracted Compl. Date	Notes
Ferrovial Agroman US Corp.			
North Tarrant Express Segment 3A, Texas	\$985 Million	September 2018	
I-77 HOT Lanes, North Carolina	\$448 Million	February 2019	
Texas High-Speed Rail, Texas	\$130 Million*	TBD	*Development phase
Griffith Company			
Berth 142-143 Backland Automated Terminal, California	\$105 Million	February 2017	
Euroestudios			
Ankara-Istanbul High-Speed Train Project, Turkey	\$3.6 Billion	2018	
Hassi Mefoukh - Mostaganem Rail Line, Algeria	\$226 Million	2018	
Bogota Integrated Public Transport System, Metro Line 1, Columbia	\$6.8 Billion	2018	
Antequera-Algeciras High-Speed Rail Line, Antequera-Ronda Section, Spain	\$795 Million	2018	
OTHON			
North Tarrant Express Segment 3A (Southern Section), Texas	\$650 Million	2018	Design was complete in August 2015
North Tarrant Express Segment 3C, Texas	\$200 Million	2018	
U.S. 290, Texas	\$1.3 Billion	2017	





COMMITMENT

LOCAL HIRING

We will forecast labor resources requirements, perform proactive outreach and actively engage local unions to identify local hiring, apprenticeship and union membership opportunities, and fulfill the requirements of the Community Benefits Agreement.

B. LABOR RESOURCES

This project may require an estimated 500 construction crew members working each day at peak construction. Construction packages 1 and 2/3 will be under construction at the same time and will require similar resources. The sheer magnitude of these three projects is likely to impact the availability of skilled craftsmen, equipment and materials locally and throughout California. The economic recovery (and the resulting concurrent labor demands) will further affect worker availability. With the recent downturn in oil prices, construction workers in the oil fields have seen a decline in the available jobs in the Bakersfield area. Recent estimates are that more than 1,800 full time jobs have been lost. Using our resource-loaded schedule, we will project and track resource needs throughout the project. We will partner with local unions, agencies and subcontractors to identify workers and employ them on our team.

APPROACH TO ENSURING WORKER AVAILABILITY

The estimated workforce for this project will average 150 per day and may require 500 per day at peak. We will mobilize specialized workers for construction activities such as structural concrete, railroad relocation and welding. Overall, our approach is to fully understand and forecast our labor resource requirements and cast a wide net to identify and recruit a skilled labor force. Each element of our plan is more fully described below.

We've Done It Before

On the I-635 LBJ Express project in Dallas, we expanded the labor pool for bridge work. Working with two subcontractors, we established two precast facilities to meet demand. We helped train them to perform bridge work, expanding their capacity and creating additional resources in a work category. Establishing these facilities increased production of materials, fabricating 2,500 beams and 1,500,000 square feet of panels within 24 months. These project-dedicated facilities allowed rapid adjustment to schedule changes, minimized equipment and personnel stopages resulting from material shortages and eliminated conflicts with other projects outside our control.

COLLABORATION WITH LOCAL UNIONS AND BUILDING TRADES COUNCILS

To prepare for our labor requirements and prevent labor shortages, we will work with the local unions, Workforce Investment Board, Central California Workforce Alliance, universities and colleges to identify sources for workers, by trade, well in advance. Working with these groups, we will maximize the effectiveness of recruiting and training potential workers so they are available to support the construction.

We will meet with union leadership and apprenticeship programs in the area to assess current and expected worker availability, and become familiar with the local procedures for recruiting, testing and enrolling new workers (both those new to the trades and those relocating from other jurisdictions). These meetings will take place no less than several months before construction begins, so that candidates can make it through the pipeline and be trained and ready for dispatch when we need them.

We will initiate our labor search and contracting early, and will focus first in the local market to involve and engage as much local labor as possible. We will hold hiring events for local craft workers in Tulare and Kern counties. This approach enables us to offer competitive salaries (locals will not need housing and other services) and transfer goodwill to the local community, thus building project ownership, leading to better quality and fewer community conflicts. We will





monitor the availability of local labor resources, and will recruit from other regions that have an abundance of labor when necessary.

SUBCONTRACTOR RESOURCES

Our subcontractors will be our partners in managing resource challenges. Together, we will develop accurate schedules that allow effective forecasting of work. Subcontractors will receive timely payments to alleviate cash flow concerns. If these measures prove inadequate to fulfill staffing requirements, we will engage other subcontractors, potential employees and unions to resolve the shortfall.

WORKER RETENTION

Worker retention is also a concern — we need to keep all skilled workers on the project until the work is complete. Preventative actions include providing an overall good working environment including competitive wages, excellent working conditions and temporary housing support services. In addition, we may provide incentives for completion of milestones to keep staff engaged through critical work elements.

LOCAL COMMUNITY PROGRAMS

We will establish relationships with churches, neighborhood associations and local leaders, including the Workforce Center in Bakersfield, to identify potential labor resources and to spread our message. Other programs include:

- **On-the-job Training** – To help local workers develop new skills needed to support the construction — such as surveying or scheduling — that can be used after completion of the project
- **Helmets to Hardhats** – Recruiting veterans and helping them transition to construction crews
- **Partner with Local Farming Communities** – Retraining Central Valley workers displaced by drought for new careers in construction
- **Visitor's Center** – Providing resources and information for people interested in working on the project
- **Local Construction and Construction Personnel Agencies** – For assistance in expanding our recruiting activities

COMPLIANCE WITH THE AUTHORITY'S COMMUNITY BENEFITS AGREEMENT

As discussed in *Section 4 – Small Business Participation*, our team is committed to complying with the Authority's Community Benefits Agreement and will take steps to ensure targeted hiring initiative requirements are ongoing, both internally and by our subcontractors. We understand that employment of local workers and enhancing their skills provides both long- and short-term benefits to the community and is key to achieving on-time completion.

Available Workers

We have resources demobilizing from the recently completed North Tarrant Express Segments 1 and 2 and I-635 LBJ Express projects that could be mobilized to this project. Over the next six months we will have 30 from our management and administration teams available for reassignment.

We've Done It Before

Creative Approach to Meet Resource Requirements

On the SH 130 Segments 5 and 6 project, our team implemented a full-width echelon paving operation — two asphalt pavers lay dual lanes of pavement simultaneously. Rather than paving individual 12-foot lanes, the team paved the full width of the roadway in a continuous 40-foot pull. To do so, we purchased two large, high-density pavers and the equipment needed to supply the large amounts of asphalt required to keep the pavers operating at full speed and ahead of schedule.

This activity also became a mentoring opportunity. Because the asphalt subcontractor was a small DBE firm and could not afford to purchase the equipment, our team purchased it and brought in experts to provide operational training to the subcontractor's employees.





SH 130 SEGMENTS 5 AND 6

On this project, Ferrovial Agroman gave the steel supplier ample notice of how many pounds of steel would be needed for paving and other operations so they could produce and fabricate the material during their slow times. This win-win arrangement leveled production schedules at the factory and gave us the steel when we needed it.

CONSTRUCTION MEANS AND METHODS

We will also consider worker resource availability in the selection of our construction means and methods. For example, we plan to use precast concrete rather than cast-in-place materials where possible. In addition, our design minimizes the amount of work required by potentially limited resources.

1. Timeline Analysis

Our resource-loaded baseline schedule demonstrates our assumptions and ability to meet the contract completion deadlines. Figure 3-6 (on the next page) provides an example time chainage chart for the project. The chart shows our management team where we will require multiple crews working in different areas and allows us to visually understand potential resource constraints.

2. Trade Analysis

The construction work will require skilled trades, including personnel experienced in rail structures, civil work, utilities and foundation work. Working with the unions and our subcontractors, we will review our labor forecasts and develop strategies to identify sufficient workers in each category. Figure 3-5 identifies each trade, the anticipated number of workers required during peak construction, and local union resources. With a foundation established by decades of work in the region by Griffith, and outreach by Ferrovial Agroman during the proposal phase, we have established trade council relationships that will be nurtured to help ensure we have no labor shortages during the project.

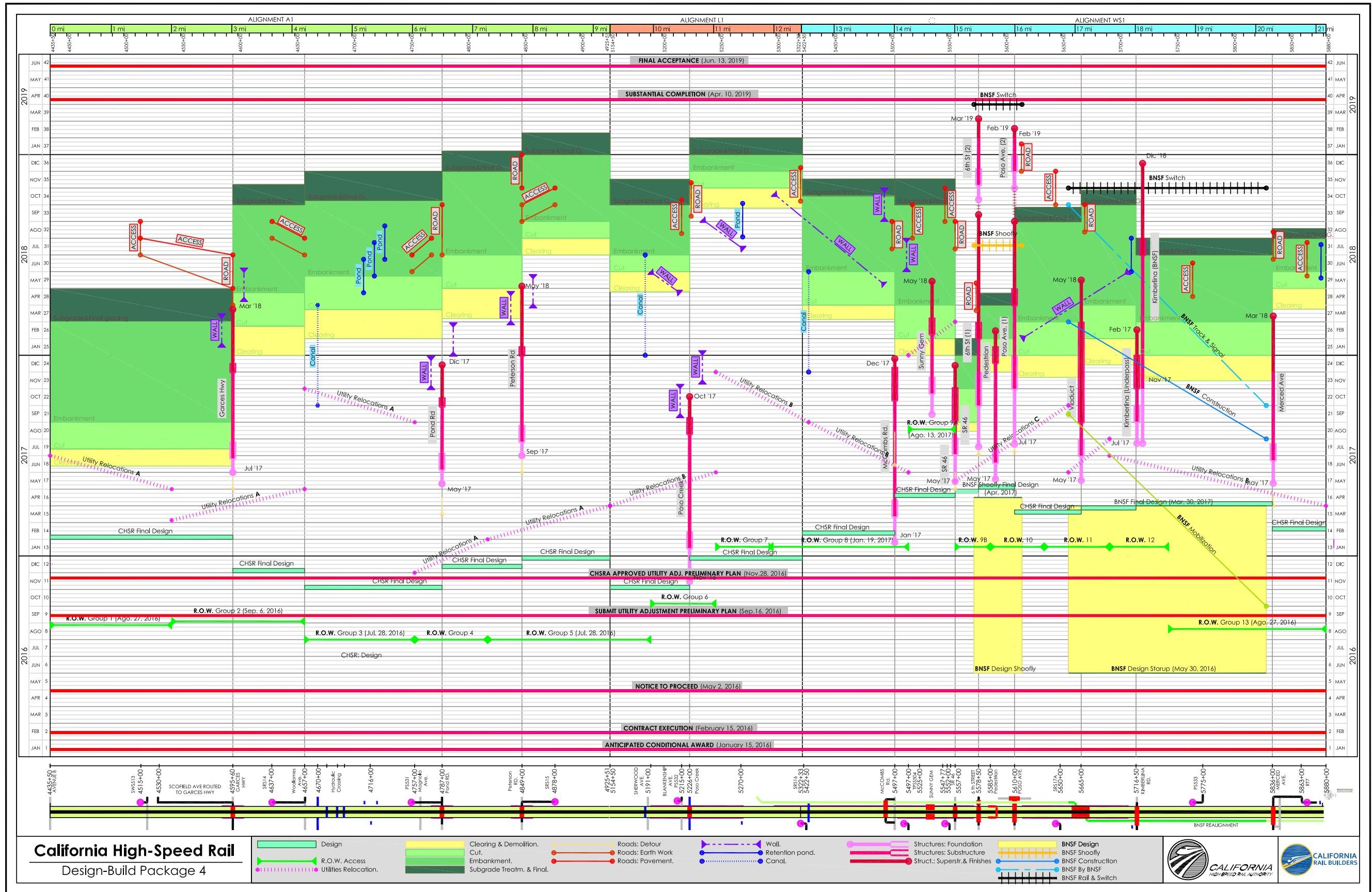
Figure 3-5: Analysis of Required Trades and Availability

Trade	No. of Workers (Peak)	Available Union Workers
Carpenters	60	■ Carpenters Local 743: approximately 500 members
Operating Engineers	75	■ Operating Engineers Local 12 has more than 20,000 operators and District 3 has approximately 500 active in the local area. If for any reason the 500 members and new apprentices cannot service the project District 3 will reach out to other districts and pull in qualified operators from other areas.
Ironworkers	30	■ Ironworkers Local 155: approximately 370 members
Teamsters	80	■ Teamsters Local 431: approximately 2500 members
Laborers	120	■ Laborers Local 294: (Fresno, Madera, Kings and Tulare counties) : approximately 1,000 members/80 apprentices
Cement Masons	50	■ Over 115 Cement Masons Local 600 in the Bakersfield area and the ability to reach out to other areas





Figure 3-6: Time Chainage Chart





C. SAFETY AND SECURITY

Safety and security is our highest priority. We support the Authority's directive that all trains, facilities, systems and operational processes be designed, constructed and implemented in a manner that promotes the safety and security of persons and property. Design and construction of the project will comply with applicable safety and security laws, regulations, requirements and railroad industry practices, including all FRA railroad safety regulations, as well as:

- California Code of Regulations Title 8 Construction Safety Orders (Cal-OSHA)
- FRA regulations as found at 49 CFR 214, 49 CFR 219, 49 CFR 225, 49 CFR 228, 49 CFR 236
- California Public Utilities Commission (CPUC) General Orders
- Other applicable federal and state Occupational Safety and Health Administration (OSHA) regulations

We will develop and implement the required Reliability, Availability, Maintainability and Safety (RAMS) Program Figure 3-7. Safety, accident prevention and security breach prevention will be incorporated into the performance of every task, including subcontractor work. Safety and security management will be administered by our team — we will not delegate or subcontract this leadership responsibility.

Through active participation, cooperation and compliance, and effective coordination with the Authority, we will achieve the Authority's objectives in Section 26 of the General Provisions. Our approach to safety will be detailed in our site-specific management plan (SSMP):

- **Safety First** – Design, plan and execute all work to prevent personal injury, property damage or loss including proper use of personal protective equipment and all required safety equipment/devices
- **Compliance** – With federal, state and local laws, ordinances, regulations, and industry standards; and Authority and our team's regulations, policies, procedures and requirements
- **Prevention Through Design** – Incorporate safety considerations into the design of a system element to avoid, eliminate or mitigate hazard risk Figure 3-8 on the next page
- **Awareness, Prevention and Correction** – Implement and maintain a system of prompt identification and correction/abatement of unsafe and unhealthy practices and conditions



Our safety goal for this project is simple, achievable and straightforward: zero accidents.

COMMITMENT

We will establish a safety program with a goal of ZERO accidents. Our approach includes strong leadership from our project management and safety teams and conscientious development and implementation of all safety and security plans.

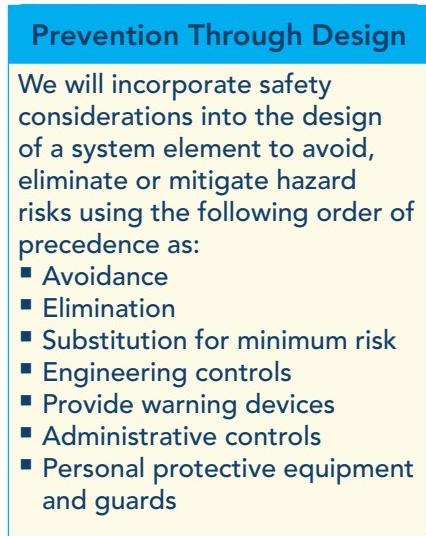
Figure 3-7: RAMS Components

RAMS Program

Our project-specific RAMS will incorporate the Authority's requirements, addresses our operations and comply with our quality program. We will consider life-cycle costs; we understand that selection of materials, means and methods will maximize the future HSR system reliability, adding value for the Authority and users. Decisions that could be influenced by RAMS considerations include:

- Up-sizing drainage features to minimize maintenance
- Developing redundancy in the lift stations and pump stations to handle extraordinary volumes of stormwater
- Providing back-up power generators for critical systems
- Reducing the number of joints in long-span viaducts and improving safety of future maintenance personnel



**Figure 3-8:** Designing for Safety

- **Incident Response, Investigation and Corrective Action** – Promptly notify the Authority and investigate all incidents of injury, damage or near-miss incidents to determine causes and take necessary corrective action
- **Training** – Establish and conduct an educational program including safety and security meetings and training programs to stimulate and maintain the interest and cooperation of all employees (Figure 3-9)
- **Secure Facilities** – Establish and maintain a comprehensive security program encompassing personnel, facility and site management in conjunction with emergency planning and response procedures

The fundamental goal of our safety programs is zero accidents. Working safely will always be a core value — it is integral to our culture. As shown in Figure 3-10 on the next page, all management and workers are responsible for implementing safe practices, will be recognized for safety and will be part of the process for continually improving our safety program. We empower personnel with stop-work authority when observing unsafe activities. Our project safety organization includes safety managers for each construction segment who report independently of the segment leadership.

SAFETY INSPECTION

Safety inspections are conducted by the safety manager, safety coordinators, traffic safety manager, traffic safety officer, traffic assistants and by field superintendents/general foremen. The inspections include:

- Daily unscheduled safety assessments by the safety manager and safety coordinators
- Weekly safety assessments conducted by the safety manager and safety coordinators accompanied by superintendents and general foremen
- Monthly safety assessment conducted by a team designated by the construction manager and including at least the safety manager, safety coordinators and foremen

Figure 3-9: Training Plan



SAFETY AND SECURITY CERTIFICATION PLAN

The safety and security certification plan will detail the responsibilities and processes required to demonstrate that the project is safe and secure. The objective is to achieve an acceptable level of risk through prevention and systematic approach to safety, design criteria, specification and construction compliance. (See Figure 3-11)

The plan will describe in detail how we identify, mitigate, verify/validate, and certify safety and security requirements. V&V procedures will detail the certification and submittal process for the safety and security certification packages in compliance with the requirements of the SSMP and the V&V procedures. For the safety and security certification plan, we will use the certifiable elements and hazards log, job site hazard assessments, certifiable items list, open item list and risk register to ensure that safety issues and security concerns are addressed and tracked to resolution. See also *Section 2.D – Design Configuration Management and Quality Control*.

INNOVATIONS

Our safety plans include strong and specific programs that encourage the best practices implementation. Examples includes:

- **LIFE (Looking for an Incident-Free Environment)** – Constantly designing fresh and innovative ways to train and remind our employees of best practices (at work and at home) and that any decision affecting production, cost and time must be made within the context of safety which is a non-negotiable value
- **Engineered for Safety** – Fully engineered and stamped drawings for elements such as false work, temporary shoring and bridge brackets, as well as the traffic control drawings, will contemplate safety measures for the complex construction activities
- **Fall Prevention** – Fall prevention and protection guidelines, used for work higher than six feet, required for fall protection from structures, ladders, scaffolds and aerial lifts. We use guardrail and safety net systems, hoisting, harnessing and controlled access zones.
- **Weekly Traffic Management Meetings with Local Authorities** – Weekly task force meetings with the Authority, Caltrans, emergency service providers, traffic personnel (City of Wasco, Tulare County and Kern County) and our personnel, including our public communications team
- **Performing Construction Under Live Traffic** – Our safety team will review, approve and provide continuous verification during construction of our

Figure 3-10: Approach to Safety



Figure 3-11: Safety and Securing Certification

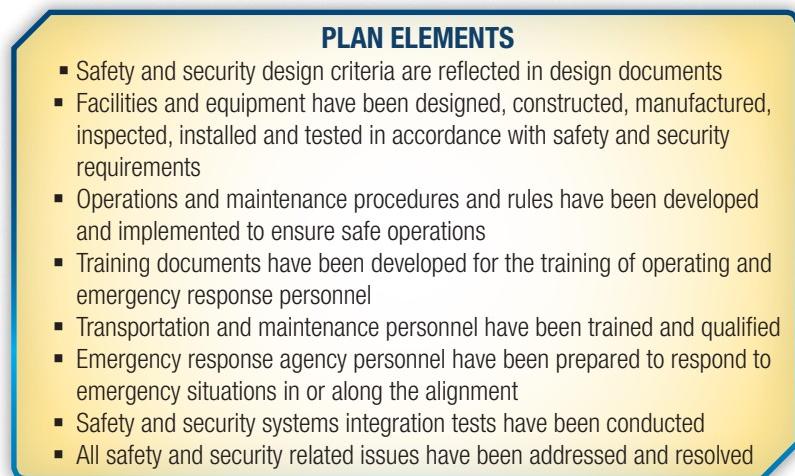




Figure 3-12: Construction Team Safety Roles



traffic management plans (ensure that signage provides effective communication to the public, construction zone speed limits are appropriate and plans are in accordance with the Manual on Uniform Traffic Control Devices. Our plans will address safety of workers and the public during rain, flood, high winds and other severe weather conditions)

- **Excavation Work Plans** – Our design, construction and safety teams will work together to ensure the special designs and work plans for excavation meet all safety requirements (verify that the equipment is appropriate for the excavation depth specified, that all required worker training is identified and implemented, and that a process for hazard identification and control is defined)

1. Safety and Security Manager Qualifications

As shown in Figure 3-12, everyone is involved in safety. Our safety organization is led by Safety and Security Manager Bill Abbott, CHST, who will develop and implement the SSMP, site-specific health and safety plan (SSHASP) and site-specific security plan (SSSP). He will be supported by safety leads assigned to each segments.

QUALIFICATIONS

With more than 35 years of health and safety experience, Bill's construction experience includes developing and implementing construction safety programs on large civil projects including rail, bridge, highway, roadway and excavation elements on heavily traveled corridors. He has worked with the railroads to coordinate rail safety training, and has managed multi-site safety organizations including up to 22 safety professionals. He recently served as the safety director on the \$1.45 billion North Tarrant Express Segments 1 and 2 project constructed in a dense urban environment under live traffic and around BNSF facilities.

Bill is a certified Construction Health and Safety Technician (#C3302) and holds numerous other certifications including OSHA trainings. He is an OSHA 500 Construction Trainer, and has been a Texas Engineering Extension Service-authorized excavation safety trainer since 1994 and confined space entry “train the trainer” since 1993. He also holds the National Safety Councils Advanced Safety Certificate.

RESPONSIBILITIES AND AUTHORITY

Bill will develop a SSMP, SSHASP and SSSP that identifies the local conditions and requirements for the site and work to be performed. He will be responsible for ensuring employees and subcontractors comply with the SSMP, SSHASP and SSSP. He will provide safety leadership to the design team to eliminate potential hazards in the design phases of the project. He will also provide support to the public communication team for all safety-related questions and issues.





2. Staffing Levels

As shown in Figure 3-13, Bill will be supported by a team of up to six qualified field safety representatives (at peak of construction). These individuals will have all required years of experience, certifications and trainings; their qualifications will be submitted to the Authority for review and approval.

SAFETY TEAM RESPONSIBILITIES

Our safety team will have strong support and active participation by management, and the design and construction leads which is essential for safety program success. Under Bill's leadership, segment safety and security managers will work with the construction team to plan safety into each phase of the work. The shift field safety and security supervisors will monitor work performed and coordinate with the construction teams in the implementation of good safety practices. The safety team will perform project safety audits, training safety program, conduct weekly safety meetings, develop and administer the project's safety incentive program, and continuously monitor and review safety performance during planning meetings.

JOB HAZARD ANALYSIS. The safety team will work with construction teams to develop a job hazard analysis prior to the start of work in each segment. The assessment will include work plan reviews and strategies for the team to safely perform the work with the right tools, equipment, experience and approach. The job hazard analysis will be documented in electronic format and available for review by the Authority. During construction, the safety team will perform daily safety inspections that identify hazardous conditions, and communicate and resolve any issues immediately.

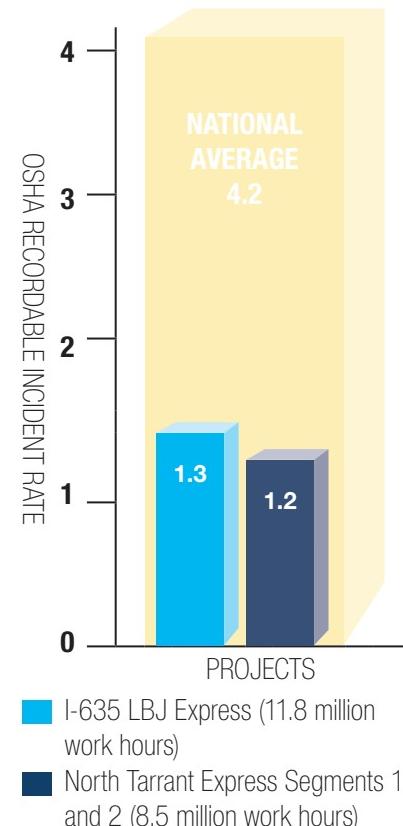
RISK MANAGEMENT PLAN. Safety leads will prepare a risk management plan and submit it to the Authority for review and approval. *Section 3 – Anticipated Problems and Proposed Solutions* of the plan will include the risk register that is an expansion of the one included as Figure 1-11 on page 21, which, among other items, identifies safety hazards and security vulnerabilities.

PLAN IMPLEMENTATION. Our safety team will work with design and construction to ensure all work is planned and executed in compliance with the stated objectives and requirements contained in the Authority's safety and security policy statement; our SSHASP and SSSP; contract provisions; applicable federal, state and local laws and regulations; and industry standards.

INCIDENT RESPONSE, INVESTIGATION AND CORRECTIVE ACTION. In the event of an incident, after the emergency has been resolved, the safety team will perform an investigation to understand the cause and identify solutions for preventing recurring or future incidents. We will

Figure 3-13: Safety Management Team Full-Time Personnel

FTEs	Team/Position
1	Safety and Security Manager
2	Segment Safety and Security Supervisors
2	Shift Field Safety and Security Supervisors
1	Administrative and Document Control
1	Safety and Security Certification Engineer
7	Total



The North Tarrant Express Segments 1 and 2 project was recently recognized by ENR Texas & Louisiana with the 2015 Best Safety Award. The project was also named Best Project in the Highways/Bridges category.





verify implementation of corrective measures to prevent a recurrence. Lessons learned will be shared and communicated to the team.

SUBCONTRACTOR SAFETY. All subcontractors will be required to comply with our safety and health plan. Subcontractor staff will participate in employee safety trainings and will receive additional training (such as crane operation, confined space or elevated work) as appropriate.

MANAGEMENT TEAM RESPONSIBILITIES

The project management team (project manager/director, construction manager, segment managers, superintendents, foremen and safety team) participate in safety and security activities, implementing the measures needed to solve any situation or unsafe event that arises. Safety and security information, including all inspections and reports, will be shared with the management team to incorporate lessons learned, adapt future work activities and implement corrective measures.

Project Manager/Director Alvaro Gomez-Muro will support Safety Manager Bill Abbott in the implementation and enforcement of the safety program. Alvaro ensures that personnel and materials are available to perform all the health and safety activities needed to accomplish with the safety program, regulations and company objectives.

D. ENVIRONMENTAL APPROACH AND STAFFING

We fully understand the environmental requirements and will implement them using our environmental management system (EMS) — our successful model used on our projects throughout the country in accordance with the ISO 14001:2004 standards (Figure 3-14).

Figure 3-14: EMS Cycle in Compliance ISO 14001



1. Identifying Requirements

ENVIRONMENTAL MANAGEMENT SYSTEM

Our EMS will be developed with the elements shown in Figure 3-15 on the next page. As discussed in *Section 2.E – Environmental Compliance*, as part of our EMS, we will develop an environmental compliance plan (ECP) that establishes the process, procedures and protocols for achieving, monitoring, documenting, and communicating compliance with the environmental requirements. The EMS provides the framework to track ongoing issues, identify environmental compliances and non-compliances and identify any actions required to correct any instances of non-compliance.





STAFFING – OUR ENVIRONMENTAL TEAM

The process will be led by Chris Tolar, an environmental compliance and permitting expert with more than 15 years of experience, who will serve as our environmental compliance manager. He will be supported by a team of environmental specialists with expertise in:

- Sustainability
- Carbon footprint
- Waste management
- Recycling plans
- Geographic information systems
- Regulatory waters
- Stormwater pollution prevention plans
- Hazardous materials
- Air quality, noise and vibration
- Energy use (as defined by LEED and CalGreen)
- Biology, botany and special-status species
- Paleontology, archeology and cultural resources
- Architectural history
- Native American monitoring

Chris will serve as a senior member of our project management team and will be responsible for managing the overall environmental compliance, including environmental approvals and re-approvals, permitting and implementation of the mitigation measures, and other activities that achieve the team's goals. Our environmental compliance manager has the authority to stop the construction work if needed to ensure compliance.

ENVIRONMENTAL AWARENESS TRAINING PROGRAM

Achieving our goal of zero violations requires environmental training of all design and construction personnel, including subcontractors and consultants. We train personnel how to identify an environmental issue, report it and implement the defined protocols. Training will comply with the requirements of the *Mitigation Monitoring and Enforcement Plan*, ECP, and the governmental approvals including the Biological Assessment/Opinion, California Department of Fish and Wildlife 2081 and archaeological treatment plans.

In environmental training sessions, preconstruction meetings and prior to major work activities in environmentally sensitive areas (ESA) or near environmentally restricted areas (ERA), our environmental team will detail methods and procedures, and educate personnel on topics such as:

- Compliance responsibility, including background, environmental concerns, regulatory overview and worker/supervisor responsibilities
- Environmental commitments, approvals, terms and conditions including an overview of the *Mitigation Monitoring and Enforcement Plan*, applicable environmental state and federal laws, stormwater pollution prevention plans and hazardous material handling protocols

COMMITMENT

STOP WORK FOR ENVIRONMENTAL CONSIDERATIONS

We will train staff to make it clear that anybody on the job has an obligation to stop work for an environmental compliance concern.

RECYCLING

We are committed to recycling 100 percent of the generated construction debris that can be recycled.

WATER REDUCTION

We will construct the project using the least amount of water possible. Our ATCs reduce fill construction and concrete — both activities require significant water.

Figure 3-15: Environmental Management System

Plan Elements

- Procedures for satisfying and ensuring compliance with all environmental obligations
- A comprehensive list of obligations and approaches, procedures and protocols including environmental awareness and training, document management, EMS conformance and auditing, environmental contingency, emergency response plan, permits and approvals, communications strategies and review process and timelines
- Monthly tracking summary for requirements related to status of environmental permits and approval submissions
- Personnel responsible for environmental management including a description of responsibilities, authority and reporting relationships
- Procedures for environmental monitoring and reporting and incident reporting and tracking
- Integration with the quality management plan *Section 1.C – Master Quality Plan Approach and Commitment*





On the I-636 LBJ Express project, Chris Tolar's environmental team conducted more than 80 site inspections per month.

- Sensitive species identification and observation response protocol
 - Daily environmental actions for construction site opening and closing
 - Wetlands and habitat map and signage interpretation
 - Best management practices (BMP) including pollution prevention, erosion, sedimentation, refuse management and dust control measures
 - Noise, vibration and neighbor impact reduction and monitoring

MONITORING, UPDATING AND REPORTING

The ECP will identify the process for conducting routine assessments and establish the tools for monitoring and measuring compliance. We will use the Authority's Environmental Mitigation Management and Assessment (EMMA) tracking tool to document compliance. All non-compliance, incident, or non-compliance/corrective actions, will be reported to the Authority via EMMA within 24 hours of the event and will require Authority approval before issue close-out. Other governing authorities will be contacted according to the ECP's communications protocols.

EMMA compliance reports will include photos, problem descriptions, attempted resolutions and proposed remedies, and signatures of the environmental and construction teams. Post-event investigations will identify corrective actions, process and/or procedure changes and lessons learned. With Authority approval, the ECP will incorporate adaptive management to reflect changed conditions and process improvements.

After project award, we submit our Interim ECP (IECP), activate our environmental team and finalizing the ECP. The IECP will include protocols for conducting or postponing field activities, geotechnical surveys or preconstruction surveys pending any governmental approvals.

Our ECM will coordinate governmental approvals and supplemental or amended governmental approvals among staff that has experience in preparing approval documents and specific knowledge of species and resources. The specialists will review preconstruction survey and test results conducted under the IECP and work collaboratively to integrate their findings into the ECP. Once all governmental approvals have been acquired, the environmental compliance manager will coordinate with the Authority to provide a comprehensive background on the interpretations and specific measures or conditions of the governmental approvals.



2. Addressing Environmental Issues

Our approach for addressing environmental requirements is shown in Figure 3-16. Figure 3-17 on the next page describes how we will address issues that arise during construction. All technical contract submittals will contain an environmental compliance report that identifies alignment of the design with the final environmental documents and governmental approvals. Aspects that are not in compliance will follow the Authority's three-step environmental re-examination process (described in *Section*





2.E – Environmental Compliance). Our environmental team and all employees will have authority to stop work to avoid resource impacts.

BIOLOGICAL RESOURCES

As described in *Section 2.E – Environmental Compliance*, prior to construction, a qualified biologist will survey and delineate environmentally restricted areas (ERA) and environmentally sensitive areas (ESA). Environmental inspectors and the project biologist will enter daily reports in EMMA to document:

- Daily preconstruction and post-construction site clearance surveys
- Established ESA buffer distances and new areas requiring flagging as an ESA/ERA, especially during nesting bird season
- Sensitive species observations, locations (GPS points) and behavior
- Repair and maintenance of ESA/ERA boundaries
- Narratives and photos for non-compliance, level of non-compliance

Environmental inspectors will observe the ESAs and ERAs and ensure at the end of the day that culverts, holes and trenches are properly covered to prevent entrapment of small mammals and/or reptiles. Any “take” mortality or “harm” of a sensitive species will be documented, reported to the Authority and applicable regulatory agency within 72 hours or sooner. The project biologist and/or environmental inspector will recover the body, or remove alive animals in danger by passive or direct relocation.

NOISE AND VIBRATION

As described in *Section 3.F – Minimizing Impacts to the Public*, our team is committed to being a good neighbor and performing work in a manner that prevents nuisance conditions. Construction site managers and/or monitors have the authority to stop work until nuisance noise conditions are resolved. We will schedule and conduct operations in a manner that meets or exceeds Authority, city and/or county general and specific plans regarding disturbance to residential neighborhoods, care centers such as the senior citizen residential facilities and critical facilities such as schools and hospitals. Figure 3-18 highlights elements of our noise and vibration plan. In addition to the strategies discussed in *Section 2.E – Environmental Compliance*, features of our approach include:

- Minimizing use of generators and using equipment with efficient noise-suppression devices
- Enclosing trucks and lining hoppers with noise-deadening material
- Restricting hours of operation and permitted areas for vehicle/machinery movement
- Constructing enclosures, barriers or noise tents around jackhammers and other loud equipment near sensitive receptors/neighbors

Figure 3-17: Using EMS to Identify Additional Work

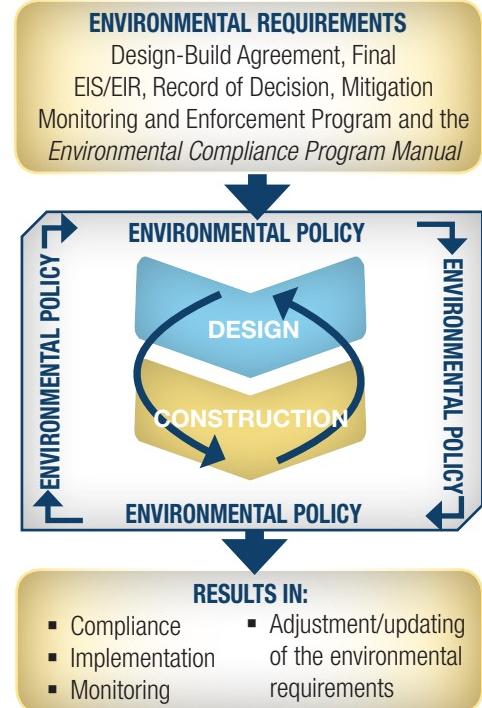


Figure 3-18: Noise and Vibration

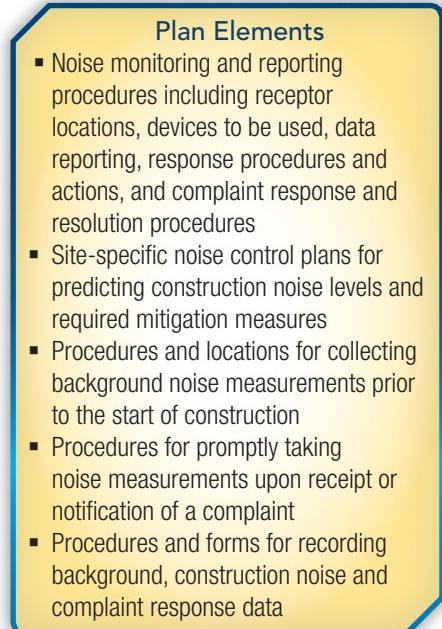




Figure 3-19: Construction Sequence for Erosion and Sediment Control Procedures



STORMWATER QUALITY

Our objective for water quality is zero discharge. Figure 3-19 shows our approach to construction sequencing stormwater pollution prevention plan activities including water recycling opportunities, and BMP for erosion and sediment control protocols. We will proactively manage the plan, and check temporary measures before and after each storm event. The proposed BMPs will comply with the approved stormwater pollution prevention plan in accordance with the State General Construction Permit requirements.

AIR QUALITY

We recognize the current non-attainment status for various criteria pollutants in the Central Valley and the Authority's strong commitment to minimize adverse impacts. We will use the cleanest reasonably available equipment for all off-road and on-road construction diesel equipment and follow the air quality mitigation measures included in the *Mitigation Monitoring and Enforcement Plan* and FRA Final Air Quality Conformation Determination. The off-road construction equipment will meet EPA Tier IV requirements whenever possible; all equipment will be certified to meet EPA Tier III level; and our fleet will be reported and monitored to comply with the San Joaquin Valley Air Resources Board requirements. We will use hauling trucks meeting 2004 On-Highway Heavy Duty Engine Emissions Standards or cleaner. We will use clean fuels such as propane or ultra-low sulfur diesel, and cleaner diesel control technology, including EPA or California Air Resources Board-verified diesel particulate filters or diesel oxidation catalysts. Examples of additional air quality control measures include:

- **Movement of Machinery** – Spraying dirt roads with environmentally safe polymer emulsion, limiting speed of machinery, cleaning paved roads of any accumulations, and limiting height of dust-emitting loads to no higher than the freeboard
- **Demolition** – Using polymer emulsion
- **Stockpiling Material** – Selecting locations away from wind, covering stockpiles, spraying surfaces with water or covering with tackifier
- **Treatment Plant Aggregates** – Using screens to reduce emissions from belt conveyors, spraying conveyors with water prior to use

COMMITMENT

CONSERVATION

We will use sustainability principles to locate local building materials, reduce energy usage and conserve water (harvest rainwater, capture and recycle waste water for dust control or soil conditioning, and reduce water use in mixing concrete and cleaning equipment).

AIR QUALITY

We will use the cleanest reasonably available diesel equipment for all off-road and on-road construction to reduce emissions and energy use beyond regulatory requirements, minimizing adverse air quality impacts.

HAZARDOUS MATERIALS

Our current hazardous materials mitigation plan (HMMP), guides and checklists available to environmental inspectors on their field tablets will provide consistent, accurate information





about the safe handling, storage, treatment and/or disposal of hazardous materials. The HMMP will be updated monthly, or as directed by the Authority and will include the elements shown in Figure 3-20. Our worker environmental awareness plan training will also include proper techniques for handling hazardous materials to avoid spills and accidents, how to maintain and use a vehicle spill kit and communication protocols should accidents occur. The HMMP has strict requirements for work processes and spill control and response to avoid environmental damage associated with on-site hazardous materials such as:

- **Proper Storage and Secondary Containment on Site** – Of diesel, chemicals and hazardous wastes (contaminated soil)
- **Regular Vehicle Maintenance** – To avoid spills/leaks of oil, grease and fuel
- **Contaminated Soils Removal** – Characterized and removed to a disposal facility
- **Isolation of Impacted Soil and Groundwater** – During excavation, implement standard precautions (visqueen, personal decontamination buckets and wash stations, vehicle on-board spill kits) to prevent migration to surrounding properties and neighborhoods
- **Water Protection** – Near water features, use additional BMPs
- **Re-vegetation or Application of Tackifier** – To minimize runoff during storm events once a site is confirmed to be free of contaminated materials and ready for release.

NON-COMPLIANCE SITUATIONS

The environmental team will identify potential non-compliance “incidents” and coordinate with the environmental compliance manager to determine appropriate actions. For example, during morning preconstruction clearance surveys an environmental inspector observes a raptor nest on a structure within the potential construction impact radius. The inspector may call a temporary work stoppage or flag a temporary ESA avoidance area until a decision is made through the resource hierarchy that may include the jurisdictional regulatory agency such as California Department of Fish and Wildlife about how to proceed (such as removal of the nest if the nest is incomplete or no eggs have been laid, or flagging or fencing an ESA boundary).

WATER CONSERVATION

Our ATCs significantly reduce the amount of water needed to construct the project. The elimination of hundreds of thousands of cubic yards of fill and tens of thousands of cubic yards of concrete significantly reduces the water required. We will also implement dust control products that use less water and minimize the need to water haul roads.

Figure 3-20: Hazardous Materials

Plan Elements

- List, quantities and description of hazardous materials on site
- Material safety data sheets (MSDS)
- Appropriate storage practices including approved containers, labeling and locations
- Designated responsible individuals performing inspection, updating the HMMP and maintaining MSDS binder
- Procedures for proper disposal
- Personnel training and training records (24-hour Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) training or eight-hour refresher for all employees)
- Procedures for preparing Phase II sampling, preliminary assessment scopes of work, investigative work plans and site investigation reports with conclusions and recommendations

Accommodating Unanticipated Conditions

LEVANTE HSR, ARCAS DEL VILLAR – FUENTES SECTION

While the planned schedule for this project was 34 months, the discovery of a significant paleontological site had a significant impact to the plan. Ferrovial Agroman, the paleontology team and the owner worked together to develop an extended schedule for the paleontological excavation work while maintaining the original schedule for major construction items. This was accomplished by removing the Lo Hueco tunnel from rest of the project and redesigning it as an open trench. This allowed for more paleontological excavations to take place. Modifications were also made to the Arroyo de la Motilla viaduct, including replacing the falsework construction method for the deck with a launching method which accelerated construction and reduced environmental impacts.





E. UTILITY AND THIRD-PARTY FACILITY RELOCATIONS

Design Solutions that Minimize Impacts

- In addition to eliminating the need to relocate the Semitropic Water Storage District pump station, shifting the HSR alignment slightly to the east significantly reduces several other utility conflicts in the area including power lines and irrigation facilities
- By adjusting the location of the wall for the structure over Kimberlina Road, we minimize impacts to the adjacent 66-inch water line

COMMITMENT

We will provide a single point of contact for each utility and third-party facility owner.

Our proactive coordination approach includes providing a single point of contact for each third party:

- Utility Coordinators – Robert Armstrong, PE, and Michael Buckley, PE
- Railroad Coordinator – Jon Marshall, PE
- Third-party Property Owners Coordinator – Donny Armstrong, PE

PRELIMINARY INVESTIGATIONS

Our team's approach to identifying, verifying and documenting third-party facilities, including roadways, BNSF Railway, tracks, properties and subsurface utilities, began with our review of all documents provided by the Authority and was supplemented by extensive field reviews. We also contacted the utility/facility owners to acquire specific data including contact information, system maps and record drawings. We met with the owners of facilities that have significant conflicts with the project including Caltrans, Semitropic Water Storage District, North Kern Water Storage District, Shafter-Wasco Irrigation District and the City of Wasco.

The findings from our proactive utility investigation, along with the extensive measures we have taken to prepare existing and proposed utility plans, will help us advance the utility agreement process. Because the master utility agreements are in various stages of development and each relocation requires a specific utility agreement prior to design commencement, our first task upon notice to proceed will be to obtain any and all final executed master agreements and meet with the individual owners to develop the specific agreements.

Whether executed agreements are in place or not, we will commence with positive location activities including conducting additional investigations, securing additional record drawings, and performing SUE Quality Level B horizontal utility locations and SUE Quality Level A vacuum excavation to verify the accuracy of existing data and collect additional information. Verifying the disposition and determining actual depths of underground facilities will be a primary focus of these investigations.

COORDINATION

We will ensure design proceeds according to schedule, be it by third-party owners or our team, by:

- Assigning a single point of contact for each third party
- Conducting workshops, one-on-one meetings and utility task force meetings with utility owners and other third parties
- Developing strategies and opportunities for avoiding and reducing risk associated with utility modifications and relocations
- Defining relocation, protection or abandonment of utilities





- Defining right-of-way acquisition or easement requirements
- Executing utility agreements with clear schedule expectations
- Following the Caltrans *Right of Way Manual, Chapter 13 – Utility Relocations* requirements

We will conduct face-to-face meetings with each third-party owner as soon as possible to begin the dialogue, make introductions and develop a collaborative relationship. This proactive coordination facilitates cooperation with these critical partners. Our coordinators establish clear expectations at the beginning of the project and keep third parties informed throughout construction via weekly meetings focused on scheduling, coordination, resource allocation and problem-resolution.

Based on our experience developing the preliminary composite utility plans, our adjustment team will provide concepts to each third-party entity to start their relocation design.

From there, coordination commitments include:

- Preparing applications to support relocations, new service connections and/or required rearrangements
- Preparing utility assemblies in accordance with third-party master utility agreements during the design phase
- Coordinating power connections for signals and streetlights
- Obtaining copies of the relocation utility designs, if applicable
- Maintaining frequent communication with the Authority for design revisions and concurrence on the wording of agreements
- Coordinating receipt and review of utility contracts and invoices, as all relocation fees must be paid prior to starting work
- Providing continuous coordination with utility and third-party owners throughout the relocation to verify work is compliant and on schedule
- Scheduling preconstruction meetings

UTILITIES. Typically, dry utility relocation design and construction will be provided by the utility owner with our team providing coordination. We will facilitate and help expedite the design to keep on schedule.

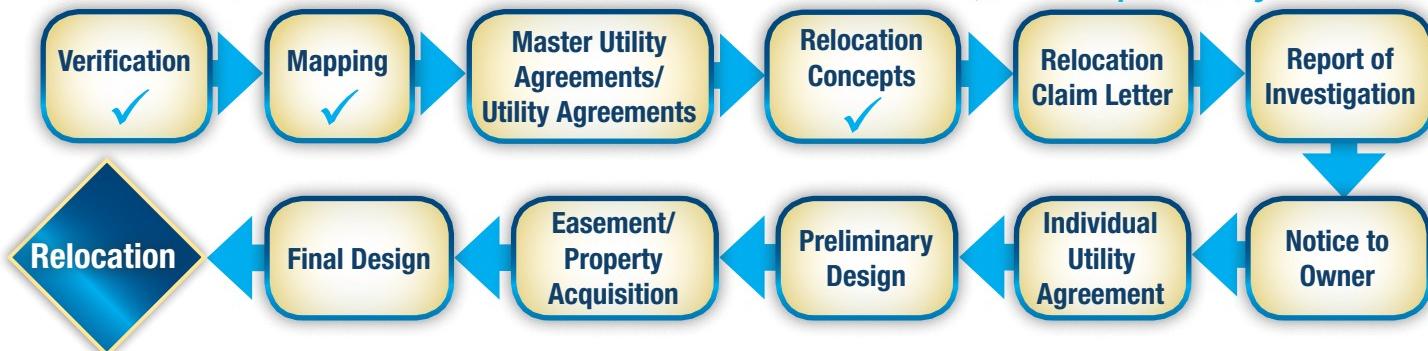
We've Done It Before

The M-30 Bypass Motorway Burying project in Madrid included a 1-mile section that was crossed by more than 150 utilities (more than one utility every 30 feet). Information technology cables, gas pipes, high voltage lines, water stacks, cable television lines, sewage system and irrigation pipes were diverted either in one or several phases. Working in collaboration with the utility owners and the client, the team developed a "mini" project plan for each utility that responded to the utility owner's requirements, industry standards and the project's requirements.

COMMITMENT

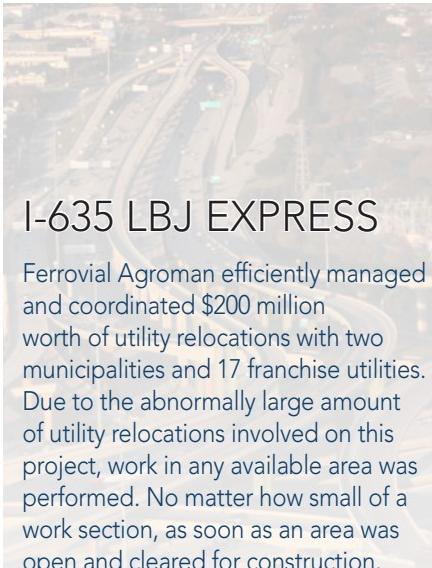
Our 100-day plan, including advanced field investigations, proactive coordination and development of a comprehensive relocation plan for the whole alignment, will help expedite finalizing agreements and jump start utility and third-party work in the field.

Figure 3-21: Utility Process Work Flow





Successful Utility Relocations



I-635 LBJ EXPRESS

Ferrovial Agroman efficiently managed and coordinated \$200 million worth of utility relocations with two municipalities and 17 franchise utilities. Due to the abnormally large amount of utility relocations involved on this project, work in any available area was performed. No matter how small of a work section, as soon as an area was open and cleared for construction, work commenced.

The team performed concurrent design and construction in multiple zones for production of stand-alone utility and plans, specifications and estimates deliverables to expedite schedule and reduce costs. They coordinated subsurface utility engineering services and utility relocations with local jurisdictions and utility companies.

Also, where possible, the team used directional drilling techniques for the relocation of utilities. This method allowed the relocation of utility lines to proceed in areas where other portions of the work are not yet open due to other constraints. Using this method instead of the traditional open trench method resulted in advancing the relocation of many utilities, accelerating the overall construction schedule.

Wet utilities are typically our responsibility. Initially, we will develop alternatives in schematic format to determine feasibility. One of the issues that will be resolved in this manner concerns the HSR design criteria for a minimum of three feet distance from drainage pipes and structures. This clearance will likely be an issue in the City of Wasco for the gravity-fed sewer and storm drain lines. Also, since the HSR structures will have a depth of three to four feet, instances occur where the gravity lines may conflict with the HSR structure or with the bedding.

BNSF RAILWAY AND AMTRAK. Work around rail lines requires a high level of coordination. Our dedicated coordinator, Jon Marshall, PE, will be the single point of contact with BNSF Railway through design and construction. He will be responsible for managing all railroad permits, roadway worker protection requirements and employee-in-charge request forms, both of which will be executed prior to any work occurring in the railroad's right-of-way. We will incorporate the railroad's review, approval and schedule requirements and durations into our overall project schedule.

BNSF Railway and Amtrak will be included in our task force groups so they can stay informed on our progress and provide input during the design development and construction. Constant communication will prevent unwanted surprises that could lead to schedule risk. We will provide timely submissions of our interim and final design drawing and work plan submittals. Submittals will include drawings in BNSF Railway's format for the main line relocation and Wasco shoofly, and documents for Amtrak's approval of their platform and station elements.

During construction, we will meet regularly to anticipate and resolve concerns, and provide updated schedule forecasts. We will secure right of entry permission and coordinate with BNSF Railway and Amtrak to establish the work footprint and clearances and track allocation schedules, and to schedule flaggers and stand down notices.

QUALITY CONTROL

Utility relocation plans will be developed in concert with other disciplines. We will perform cross-discipline quality control reviews and conflict analysis checks via regular, face-to-face design review meetings. Specifications and drawings will be reviewed for consistency. We will pay special attention to components that, in the utility industry, could potentially have quality issues such as bushings connecting existing utilities to new utilities, bedding and compaction and unexpected encounters with previously unknown utilities in the field. Areas of focus will also include long-lead items that are difficult to procure and work that has the potential to result in traffic impact for the community. Other elements used to control quality of all deliverables are detailed in *Section 2.D – Design Configuration Management and Quality Control* and *Section 3.A – Management and Organization Approach and Commitments, Effective Construction Quality Management*.





MITIGATION OF IMPACTS

Value engineering can reduce the impact to infrastructure and existing field conditions, avoid unnecessary work due to secondary issues discovered while relocating utility lines, and reduce cost substantially. Examples of solutions that mitigate impacts already incorporated in our design include:

- **Kimberlina Road/Poso Avenue/6th Street** – Locating bridge support columns and retaining walls to mitigate impacts to existing utilities that have sufficient cover at the existing grade, allowing utilities to remain in place and avoid additional utility work
 - **Semitropic Water Irrigation District Tower** – Horizontally relocating the HSR line, allowing the 0.45 MG water tank, tank mainfolds, tank drains, chemical storage, and several power and irrigation lines to remain in place
 - **Reverse Stacking Garces Highway, Pond Road and Peterson Road** – Eliminating the need to relocate a substantial amount of utilities and additional clearances/casings that would have been required to be placed around the utilities due to crossing the HSR alignment
 - **Shared Dry Utility Corridors** – Providing common utility trenches and ducts for underground dry utilities and common overhead utility poles for overhead utilities significantly reduces impacts and avoids double trenches and double utility poles

Steps we will take upon award to further minimize impacts will consider design, construction and scheduling options. Based on our initial findings, our plan includes:

- Providing Quality Level B SUE information prior to substantial design of the trackbed alignment, bridges and drainage features, particularly for major facilities (PG&E and water/irrigation districts)
 - Providing Quality Level A SUE information for utilities in close proximity to drainage, bents and major excavation/embankment prior to substantial design of roadway alignments, bridges and drainage features, particularly for major facilities
 - Designing bridge bents around existing property, roadways and utilities
 - Designing roadway alignments and drainage to minimize impacts
 - Protecting subsurface facilities in place during construction
 - Locating subsurface facilities prior to all excavation activities
 - Coordinating closely with owners and the Authority early in the project to maximize utilities that can be protected in place

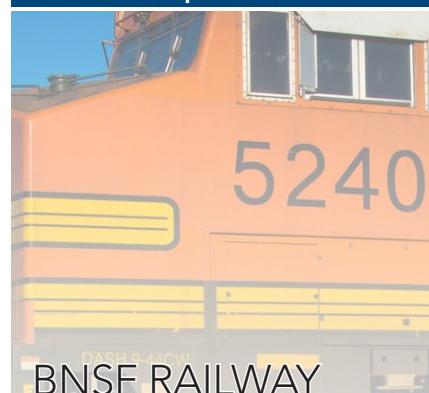
ORGANIZATION AND STAFFING LEVELS

Our utility/third-party facility coordination team is led by an experienced manager, Pablo Fernandez. Pablo will be supported by a team of more than five qualified professionals (at peak of construction) including engineers, coordinators and construction supervisors with specialized

We've Done It Before

On the Caltrans SR-134/ Olive and Pass project, Griffith constructed storm drain facilities including a pipeline, catch basins and a new waterline in the street and through the bridge. Crews also installed ducting through the bridge for phone, electric, cable and telecommunication utilities, coordinating with numerous utility agencies including Burbank Water and Power, Edison, Southwest Bell, AT&T, Charter and Comcast.

Proven Shoofly Design Experience



BNSF RAILWAY MAIN LINE

As the rail design manager for the six-track BNSF Railway underpass at Laurel Street in Colton, California, Railroad Coordinator Jon Marshall developed an innovative construction phasing plan for the three-track shoofly to maintain active operations on BNSF Railway's main line while minimizing impacts to property owners adjacent to the constrained site.





Responding to Third-party Delays



ALAMEDA CORRIDOR-EAST BREA CANYON GRADE SEPARATION

To mitigate third party utility delays on this project, Griffith executed an accelerated recovery schedule that saved 150 days. Accelerated work included retaining walls, grading, paving, landscaping and electrical work.

expertise in the specific facility to which they will be assigned, whether it be utility, building, roadway, highway or railway relocations. Our staff have the years of experience, licenses and trainings to meet the project requirements of their role. Their qualifications will be submitted for review and approval prior to field work taking place.

PROJECT EXAMPLES

Examples that illustrate our team's track record of successfully coordinating third-party project elements are provided throughout the text.

1. Critical Path Utilities and Facilities

Figure 3-22 on the next page provides a summary of the major utility conflicts. The critical path in the first 360 days for all utilities includes obtaining utility relocation agreements, potholing, identifying all necessary relocations, obtaining design standards, drafting of utility easements, and initial procurement of materials. Start of construction for utilities in Wasco south (to the end of the alignment) is also on the critical path in the first year. BNSF Railway's critical path activities include obtaining approval of the newly relocated line and obtaining design standards for all utilities within their right-of-way. All of these activities will occur in the first year concurrently with the acquisition of right-of-way, design and environmental approvals needed for the utility and third-party work. Impacts to other third-party facilities such as SunnyGem, Certis and the Amtrak Station are detailed in *Section 2.C – Setting the Alignment* on pages 42-43.

2. Utility Team Qualifications

Utility/Third-party Facility Manager Pablo Fernandez is experienced in engineering and construction management with a focus on utility and third-party facility coordination. He has managed multiple teams of utility/third-party coordinators, engineers and construction supervisors working concurrently on large design-build infrastructure projects valued at more than \$2 billion. An expert at analyzing and solving the most complex conflicts, he works collaboratively with utility and other facility owners to solve complex challenges and keep projects on schedule.

Pablo has managed all phases of the utility process including subsurface utility engineering; negotiation and execution of the master utility agreements; and design oversight and approval including coordination of multiple engineering firms. He has also managed construction of the relocations, including several subcontractors, and provided support when the relocations were performed by the utility owners. Pablo has been responsible for approving the estimates for the relocations and performing the true-up process at the end.

In his most recent project, the \$2.1 billion I-635 LBJ Express, Pablo managed a \$200 million utility relocation budget. He provided expert resolution of the most troublesome of utility conflicts and had review and signoff authority for permits requests for the project.

We've Done It Before

Pablo Fernandez led the Ferrovial Agroman utility team that managed \$200 million worth of utility relocations and created the joint-use duct bank solution that accelerated field work on the I-635 LBJ Express project.





Figure 3-22: Major Utility Conflicts (see note for those on the critical path during the first 360 days of the project**)

Facility	Owner	*Design Resp.	Challenge	Solution
Water, Sewer, Storm Drain Systems	City of Wasco	CRB	<ul style="list-style-type: none">■ Record drawings not available including material type, slope and existing condition■ No existing design standards■ The grade change at 6th Street will require a rerouting of several 8-inch and 10-inch sewer lines at G Street, 5th Street and 7th Street■ Grade change at Poso Avenue will require the rerouting of the 8-inch water line running along Poso Avenue and G Street while working with the design constraints of a grade separation and routing underneath existing the BNSF Railway tracks	<ul style="list-style-type: none">■ Potholing and other studies required to find depth, material and current quality of utilities■ Potential need for a sewer lift station at G Street depending on existing sewer slopes and depths■ Conduct design utility workshop with City of Wasco and Kern County to determine utility relocation standards and relocation of utilities
Water Storage and Irrigation Systems	North Kern Water Storage District, Semitropic Water Storage District, Shafter-Wasco Irrigation District	Utility owners subcontracted design engineers	<ul style="list-style-type: none">■ All three owners have draft master utility agreements that are not currently executed■ Relocation of utility lines could create up to 100,000 square feet of new easements to be obtained■ 18-inch North Kern irrigation line at canal realignment (station 5430+00 to station 5477+50) to be relocated for several thousand feet■ 66-inch Shafter-Wasco Irrigation District line on Kimberlina Road to be relocated for a thousand feet■ 27-inch irrigation line at station 5810+00 to be encased and constructed via a bore-and-jack method under existing BNSF Railway line and SR 43■ Shafter-Wasco storage facility to be relocated due to access road north of Kimberlina Avenue	<ul style="list-style-type: none">■ Obtain master utility agreements■ Begin discussion for procurement of materials for 66-inch irrigation line■ Contact land owners for demarcation and approval of easements■ Conduct design utility workshops with all three irrigation districts and obtain point of contacts for their respective subcontracted designers
Overhead Power	PG&E	Utility owner	<ul style="list-style-type: none">■ Based on signed master utility agreement, develop executed tasks agreement for each relocated utility■ Several 12kV power lines (station 5294+50, 5424+50, 5451+00, 5482+50, McCombs Road, SR 46, 5531+00, 5649+50, Jackson Avenue) and one 115kV power line at SR 46 to be bored-and-jacked under existing BNSF Railway line■ 12kV overhead line on the east side of G Street likely to be relocated to underground (1,800 feet)	<ul style="list-style-type: none">■ Conduct workshop with PG&E and all nearby affected utilities while individual task agreements are being finalized■ Obtain review and approval of BNSF Railway bore-and-jack design
Gas	Sempra Energy	CRB	<ul style="list-style-type: none">■ Based on signed master utility agreement, develop executed task agreements for each relocated utility■ Procurement of gas and oil materials could exceed six months■ Obtaining approval of relocation design from the utility owner could be a long-lead item	<ul style="list-style-type: none">■ Conduct workshop with Sempra and all nearby affected utilities while individual task agreements are of being finalized■ Outreach with gas line vendors to secure delivery dates for new gas lines
Telecom	AT&T	Utility owner	<ul style="list-style-type: none">■ Draft master utility agreement has not been executed■ Three AT&T overhead telecommunication lines will be bored and jacked under existing BNSF Railway line at Jackson Avenue■ Overhead telecommunication line on east side of G Street likely to be relocated underground (1,200 feet)■ One AT&T line to be rerouted outside BNSF Railway right-of-way for 1,200 feet from Jackson Avenue to station 5686+00■ One AT&T line to be re-routed within the proposed BNSF Railway right-of-way (station 5801+00 to 5816+00)	<ul style="list-style-type: none">■ Obtain executed master utility agreement■ Obtain approval from BNSF Railway for relocated utilities running parallel to BNSF Railway tracks within BNSF Railway right-of-way■ Obtain review and approval of bore and jack design from BNSF Railway
Telecom	Brighthouse Network	CRB	<ul style="list-style-type: none">■ Based upon signed master utility agreement, develop task agreements for each relocated utility■ All overhead telecommunication lines on east side of G Street likely to be relocated underground (2,500 feet)■ Due to location, likely to be a large number of telecommunication/fiber optic lines that will take a long time to reconnect	<ul style="list-style-type: none">■ Conduct workshop with Brighthouse while finalizing individual task agreements■ Develop schedule that provides shortest amount of off-line time for customers
Telecom	Level 3	Utility owner	<ul style="list-style-type: none">■ Based on signed master utility agreement, develop task agreements for each relocated utility■ One fiber optic line to be rerouted outside the BNSF Railway right-of-way (2,000 feet from station 5656+50 to 5686+00)■ One fiber optic line to be re-routed within BNSF Railway right-of-way from station 5807+00 to 5816+00■ Likely some fiber optic lines will take a long time to reconnect	<ul style="list-style-type: none">■ Conduct workshop with Level 3 while finalizing individual task agreements■ Develop schedule that provides shortest amount of off-line time for customers
Oil	Vintage Prod (Occidental Petroleum)	Contractor	<ul style="list-style-type: none">■ Master agreement not executed; drafts not available■ Procurement of gas and oil materials could exceed six months	<ul style="list-style-type: none">■ Obtain executed master utility agreement■ Conduct workshop with Vintage Prod for protection of gas line at Merced Avenue while finalizing task agreement
Oil	Shell	Utility owner	<ul style="list-style-type: none">■ Master utility agreement not executed; drafts not available■ Procurement of gas and oil materials could exceed six months	<ul style="list-style-type: none">■ Obtain executed master utility agreement■ Conduct workshop with Shell for protection of oil line at Merced Avenue while finalizing task agreement
Railroad	BNSF Railway	CRB and BNSF Railway	<ul style="list-style-type: none">■ No information can be obtained from BNSF Railway■ Design requirements for utility impacts relative to existing track unknown■ Design requirements for future track unknown■ BNSF Railway's approval of future track alignment unknown	<ul style="list-style-type: none">■ Obtain agreement with BNSF Railway on realignment of track■ Obtain design standards for new and existing utilities relocated on existing track lines, and new and existing utilities on new track lines■ Obtain approval of AT&T and Level 3 line running parallel and within BNSF Railway right-of-way (station 5801+00 to 5816+00)

*Design responsibility based on typical design/construction agreements for utility owner noted if master agreement(s) not available.

**The critical path in the first 360 days for all utilities includes obtaining utility relocation agreements, potholing, identifying all necessary relocations, obtaining design standards, drafting utility easements, and initial procurement of materials. For utilities in Wasco and south to the end of the alignment, start of construction is also on the first-year critical path including AT&T, Brighthouse Network, Level 3 Communications, PG&E, Sempra, Shell and various unknown utilities. BNSF Railway critical path activities includes obtaining approval of the newly relocated line and obtaining design standards for all utilities adjacent to BNSF Railway track.





F. MINIMIZING IMPACTS TO THE PUBLIC

1. Traffic Management Plan

Our traffic management plan is designed to reduce the “cone zone” construction period which helps to minimize community impacts, keeps traffic flowing smoothly and exceeds the expectations of stakeholders. Our approach is to maintain safe access for agricultural and other business property owners and residents. Our plan includes features and benefits that respond to the areas specific challenges and supports achievement of the goal to maintain mobility during construction. For example, we will provide alternate pedestrian access across the existing BNSF Railway crossings at either 6th Street or Poso Avenue throughout construction.

The Authority-approved traffic management plan (TMP) will describe traffic management policies and procedures and provide the guidelines for the five TMP components as shown in Figure 3-23 on the next page. These approaches include how to maintain safety and mobility and reduce impacts through the use of temporary detours, clear signing, safety barriers and proactive notifications of lane closures. Techniques we will implement include:

- Strategically sequencing crossing locations for effective flow and mitigating congestion and any unsafe conditions
- Notifying motorists of closures and work areas through a proactive public outreach program
- Coordinating with law enforcement and emergency service providers
- Reducing the number and duration of major traffic shifts at each crossing location
- Performing active outreach to stakeholders for feedback on traffic control activities
- Assuring that signals and signage are efficient and easily understood through daily inspections
- Providing our traffic control team with computer tablets to report traffic issues (including photos when applicable) and opportunities for improving the traffic plans during construction, and verify solutions are implemented
- Minimizing impacts to businesses, the community and adjacent property owners by maintaining driveway access
- Limiting traffic shifts for improved safety, consistent driver expectation and continuity throughout the corridor

We will also hold weekly traffic management task force meetings including the Authority, agency representatives, emergency service providers, Caltrans, city traffic personnel and our staff, including the public involvement and community relations team representatives.

We've Done It Before

On the Alameda Corridor-East Brea Canyon Grade Separation, Griffith redesigned traffic staging and executed an accelerated recovery schedule that saved 150 days. In the process, access to a Metrolink park-and-ride lot, a local business center and a residential community was constantly maintained. To mitigate noise impacts while constructing more than 30-foot-high retaining walls adjacent to multi-family residences, crews installed temporary sound walls prior to driving pile.

We met with Caltrans, Kern County, and the City of Wasco to determine traffic movements that will be required to be maintained while under construction. Our meetings with the local agencies have colored our traffic management and construction schedule. We will adapt our proposal plans to the current field conditions and traffic control requirements present at the time of construction.

We've Done It Before

On the North Tarrant Express project, 1,500 contacts within the community requested monthly update emails. Additional traffic updates were sent more often (sometimes daily) to the project's database of more than 3,500.





COMMITMENT

We will minimize closure of pedestrian access at 6th Street and Poso Avenue, and, when possible provide alternate pedestrian access.

Several features of our design reduce traffic impacts. For example, reverse stacking of the grade separations allows the cross streets to remain open to traffic with no significant interruption to traffic during construction and maintains existing traffic patterns.

TRAFFIC CONTROL PLANS

Our traffic control plans (TCP) are based on the California Manual on Uniform Traffic Control Devices (California MUTCD), 2012 edition guidelines, and the procedures outlined in the TMP. The TCPs include details affecting all phases of work that impact traffic, including detours, traffic control devices, striping and signage, and required safety features. All TCPs for specific activities will be submitted a minimum of 20 days prior to implementation to ensure the Authority, the City of Wasco, the counties of Kern and Tulare, and other stakeholders have adequate time to review.

Our TMP staff will simultaneously develop and implement communication strategies for informing the public of new traffic patterns to improve flow and detour plans to assist motorists in accessing businesses and other points of interest. The traffic management team is responsible for monitoring, implementing traffic control devices and efficiently moving traffic through the project.

OUR TRAFFIC MANAGEMENT PLAN IN ACTION

Traffic management strategies include:

- Notifying the community, local businesses and the traveling public in advance via our proactive public information and communications program, of temporary detours, traffic shifts and upcoming work
- Using phased construction for work on utilities and drainage facilities that cross the existing roads, minimizing the need to close lanes and impact the traveling public
- Coordinating closely with BNSF Railway to keep freight rail operations at optimum levels throughout construction
- Installing temporary signals to facilitate safe, orderly traffic flow
- Installing fencing, portable concrete traffic barriers or temporary retaining walls to protect workers, pedestrians and the traveling public

Figure 3-23: Traffic Management Plan Components





- Minimizing the number and duration of major traffic shifts to keep traffic moving
- Verifying that signals and signage are efficient and easily understood through daily inspections and by considering feedback from the community, local businesses and traveling public
- Planning lane closures and traffic changes during off-peak hours and at night

2. Public Construction Awareness Approach

In *Section 1.D – Effective Communication Approach and Commitments* we fully describe our approach to effective communication and public involvement. Our goal is to provide reliable, timely accurate information about the impacts and potential impacts the community may experience. Our public involvement team will participate in our weekly construction meetings that include discussion of the three-week look-ahead schedule and maintenance of traffic plans. They will follow up with timely notification to stakeholders regarding plans that could impact drivers, businesses and property owners. Communication strategies will follow the monthly, weekly, 30-day, 14-day, 7-day, 3-day, 72-hour and 48-hour notification periods required by the contract documents and will include:

- **Media** – We will provide print, radio, television and internet media with construction advisories
- **Website, Texts, Social Media and Applications** – We will establish a project website and social media accounts that provide motorists with current travel and road closure information and spotlights for businesses who remain open during construction
- **Signs** – Required by both our maintenance of traffic and our public involvement plans, we will place temporary signs and dynamic message signs to keep motorists informed and guide them through detours
- **Door Hangers, Newsletters and One-on-one Meetings** – We will maintain day-to-day contact with affected residents, businesses and commuters using one-on-one meetings, door notifications and newsletters
- **Hotline and Website Comments** – We will invite (and respond to) community feedback with a telephone hotline and website comment where the public can voice their complaints and issues
- **Visitor Center** – We will provide a visitor's center where the public can drop in and receive current information about the project, traffic impacts and businesses affected during construction



Minimizing Business Impacts



I-635 LBJ EXPRESS

On this project, the public was informed of project plans, traffic control and lane closures through social and traditional media such as the project website (www.lbjexpress.com), YouTube, Twitter, Facebook, the project blog (www.lbjexpressblog.com), weekly emails, text messaging traffic alerts, news releases, community events, block walks to hand deliver construction notices and meetings with community groups. In support of the businesses in this commercially-dense location, Ferrovial Agroman created an online marketplace to promote local businesses affected by the construction (www.lbjexpressmarketplace.com). As part of this initiative, the project's public information team met in person with more than 800 businesses along the corridor. Half of these businesses joined the marketplace. The LBJ Express Marketplace is a unique loyalty initiative to encourage consumers to shop local and stay loyal to businesses along the I-635 LBJ Express project.





Proactively Mitigating Impacts

Our team will identify impacts through daily site inspections and by soliciting feedback from resource agencies, the community and local businesses. As part of our commitment to continual improvement, we will review and evaluate the effectiveness of our construction plans and methods on an ongoing basis. Regular collaboration between departments and construction teams facilitates knowledge sharing, the integration of best practices, and the implementation of innovative approaches and solutions throughout the project.

COMMITMENT

POLLINATION AND HARVEST IMPACTS

The pollination season for almonds is a short three-week window that can shift based on weather and other factors. We will work with growers and farmers to anticipate the timing and take steps to avoid construction activities that might impact the bees' ability to do their jobs.

Proactive Stormwater Protection

To prevent stormwater pollution, we will monitor the weather forecast closely before concrete pours and chemical curing activities, and will have planned mitigation measures established 24 to 48 hours before the start of a forecasted rain event.

3. Mitigating Impacts

Minimizing impacts to the agricultural community, local businesses and the traveling public is critical to successful project implementation and local support during construction. Strategies we will employ include:

- Using watering and chemical stabilization to maintain access and haul roads and stockpiled material to control dust and debris
- Requiring vehicle speed reductions to control dust and debris
- Planning work to eliminate unnecessary noise, obstructions or other annoyances
- Minimizing or eliminating night work adjacent to communities that may be impacted by noise and/or light
- Testing plans for using portable lights for night work to minimize light intrusion on neighboring communities
- Monitoring and limiting work hours for activities (such as demolition or pile driving) that can cause vibration and/or noise disturbing local residents and neighboring businesses
- Using construction equipment and methodologies that minimize vibration to the extent possible
- Planning work to prevent damage to adjacent properties, particularly the businesses and agricultural properties adjacent to the project area

MITIGATING AGRICULTURAL COMMUNITY IMPACTS

The local economy is driven largely by the agricultural industry and we are keenly attuned to the needs of the local growers, farmers and related businesses. Griffith has encountered and solved similar concerns on other large projects in California.

The impact on local agriculture businesses will be minimized by communicating with local farmer's groups and impacted land and property owners. We will work with individual growers and farmers to minimize or eliminate impacts to crops. We are especially aware of the detrimental impact that dust from construction operations can have on grapes, blooming fruit and nut trees. Agriculture mitigation strategies include implementing additional dust control measures; sequencing work to occur outside of critical pollination and harvest times; and providing additional signage, traffic control and access. When the alignment bisects fields we will be sensitive to the fact that the entire field needs to be irrigated — we will not remove conveyance systems before replacement systems are operational.





MAINTAINING BNSF RAILWAY OPERATIONS

Minimizing impacts to freight rail operations is critical to maintaining BNSF Railway's support and collaborative participation in the project. We will stage construction activities around their facilities and maintain freight access through the construction site at all times. Our top down approach to construction of the bridges over 6th Street and Poso Avenue will allow concurrent construction of the HSR and BNSF Railway alignments while maintaining full BNSF Railway operations. We will coordinate our work with train schedules and implement work procedures for use during train traffic. We will foster a constructive working relationship with BNSF Railway and the California Public Utilities Commission by executing well-planned operations and ensuring required approvals for grade separations are in place prior to the start of construction.

BUSINESS ACCESS

We will work closely with Wasco Chamber of Commerce and local businesses that will be affected by construction to understand their needs and concerns, obtain feedback on our plans and implement their suggestions whenever possible. Businesses will likely find it helpful for us to coordinate our daily work schedules around their busy times and limit work near their operation, both of which we will do to the extent possible. Throughout construction, we will maintain regular communication with the businesses to confirm expectations are met and issues are resolved as quickly as possible.

The businesses along G Street will have the most potential for impacts. We commit to maintaining access to all businesses throughout construction. To do so, utility and roadway construction will occur in stages. We will also provide clear signage and, when necessary, flaggers to direct traffic. Throughout construction, we will continually monitor traffic patterns and make adjustments as needed to improve safety, access and the flow of traffic.

LOCAL RESIDENTIAL TRAFFIC

We will not close adjacent roadway crossings for construction and will maintain pedestrian access. Together with local traffic control consultants, we created preliminary traffic control plans and received input from the City of Wasco. In several cases, such as at SR 46, 6th Street, Garces Highway and others, we will keep the cross streets open and falsework designed to Caltrans standard opening requirements to minimize the traffic impacts. Whenever possible we will use right turns for detours splitting traffic around closed construction areas. In some locations, we may install temporary signals to speed the orderly flow of traffic. In the areas where we cannot divert traffic, traffic management measures we will evaluate for implementation include:

Minimizing Railroad Impacts



NORTH TARRANT EXPRESS SEGMENTS 1 AND 2

On the North Tarrant Express Segments 1 and 2, we implemented a win-win for the replacement of a Northern Pacific Railroad bridge. To accommodate the schedule, we constructed a bypass bridge for use during construction. This approach reduced the construction impacts to the railroad, reduced railroad impacts to construction, and resulted in the railroad keeping both the new bridge and the bypass at the completion of construction. The strategy resulted in a 90-day reduction in the schedule.



We will maintain BNSF Railway access to the existing Wasco Coal Terminal Transload Building during construction of the shoofly required to lower the alignment through Wasco (ATC 2).





- Installing K-rail concrete barriers (Jersey barriers) or temporary retaining walls
- Widening existing streets to accommodate detour traffic
- Providing alternate routes in the vicinity of the detour

Other strategies will employ to minimize impacts include:

- Using jack and bore construction to minimize the amount of open-trench work
- Re-routing existing utilities in accordance with City of Wasco, irrigation district and Tulare and Kern County standards
- Installing temporary utilities and connections if needed
- Immediately replacing or repairing utilities and restoring access behind the construction operation

MITIGATING IMPACTS TO HISTORICAL STRUCTURES

We will perform preconstruction surveys to identify historical structures and other facilities (such as the Poso Place Senior Apartments within 1,000 feet of the right-of-way) that are sensitive to vibration and establish mitigation plans tailored for each. We will develop site-specific vibration control plans, monitor construction vibration levels and respond promptly to complaints. Examples of measures we will consider to mitigate vibration include:

- Using deep saw-cuts to minimize transmission of vibrations from pavement-breaking operations to foundations of nearby structures
- Using concrete cutters or asphalt grinders on paved surfaces instead of pavement breakers
- Using drilled shafts rather than impact pile drivers for installation of foundations for structural elements
- Routing trucks and heavy equipment to avoid sensitive receptors
- Conducting vibration monitoring during highly disruptive construction activities, such as pile driving and drilling, particularly if situated within 150 feet of a sensitive receptor
- Properly securing street decking over cut-and-cover excavations
- Inspecting and documenting the current foundation and structural condition of any historic resource prior to construction



SECTION 4 |
**SMALL BUSINESS
PARTICIPATION**



**CALIFORNIA
HIGH-SPEED RAIL PROJECT**

Design-Build Contract for
CONSTRUCTION PACKAGE 4

Proposal | RFP Number: HSR 14-32





TECHNICAL PROPOSAL

4. Small Business Participation

A. COMMITMENTS AND ELEMENTS OF SMALL BUSINESS PLAN

We will use small business (SB), disadvantaged business enterprise (DBE), disabled-veteran business enterprise (DVBE) and microbusiness (MB) firms in all aspects of the work, and we will ensure compliance with the Authority's small business program. We commit to achieving the goal of 30 percent participation by small businesses, with at least 10 percent to DBE firms and 3 percent to DVBE firms. Our objective is to maximize opportunity for SB/DVBE/DBE/MB firms through effective outreach and coordination for the duration of the project. Our draft small business plan describes our approach to exceeding the Authority's SB, DBE and DVBE goals. SB/DVBE/DBE/MB utilization will be monitored and reported on a monthly basis.

Approach

Under the leadership of DBE expert Angela Berry-Roberson, SD/DVBE/DBE/MB Compliance Officer, we will achieve the participation goals through an integrated approach including:

- **Communications** – Timely and effective communications to the SB/DVBE/DBE/MB business community
- **Community** – Build relationships with the SB/DVBE/DBE/MB community and the various associations, groups and events so they can learn who we are and we can know who they are

COMMITMENT

FULL SUPPORT OF THE AUTHORITY'S PROGRAMS

We commit to fully complying with the Authority's Small and Disadvantaged Business Enterprise Program, Community Benefits Agreement and National Targeted Hiring Initiative Plan and to providing meaningful benefits and reinvestment to communities along the alignment.

We commit to achieving the goal of 30 percent participation by small businesses, with at least 10 percent to DBE firms and 3 percent to DVBE firms.





Figure 4-1: Maximizing Participation

Seven Steps To Maximizing SB/ DVBE/DBE/MB Participation

1. Solicit, through all reasonable and available means, the interest of certified, qualified firms and allow sufficient time for response
2. Follow up with all solicited firms via telephone to understand and document reasons for no response
3. Package work in sizes that foster opportunities for small firms
4. Provide interested firms adequate information/documentation to facilitate their response
5. Negotiate in good faith with interested firms
6. Conduct thorough investigation of capabilities before determining a firm is unqualified; verify and document sound reasons
7. Actively participate with federal, state and local efforts in the recruiting/training of small businesses

- **Connections** – Foster connections to the SB/DVBE/DBE/MB firms for potential contract opportunities through our associations in the community
- **Commitment** – Ferrovial Agroman and Griffith have company-wide commitments to diversity and using SB/DVBE/DBE/MB firms

STRATEGIES FOR MAXIMIZING PARTICIPATION

Our outreach efforts have already started! Ferrovial Agroman and Griffith have a list of more than 1,200 small business firms developed for the HSR projects generated from our outreach efforts during the past two years. As on past projects, we will use SB and DBE firms throughout every phase of the project including preconstruction, design and professional services and construction. This approach — used on the I-635 LBJ Express and North Tarrant Express Segments 1 and 2 — has proven effective for maximizing participation while using SB/DBE firms in a variety of work scopes. We conducted outreach meetings in Bakersfield on August 17, in Visalia on August 31 and in Wasco on October 12. We also participated in the August 5th Valley Small Business Event.

Maximizing participation will be the next step (Figure 4-1). Our team will develop design packages/professional service contracts sized for small businesses and allow more flexible and manageable bonding and payment measures for small firms in construction. Other strategies to maximize SB/DVBE/DBE/MB participation include:

- Close coordination and collaboration with the Authority's small business team
- Appropriately sized trade packages to maximize participation of SB/DVBE/DBE/MB firms to build capacity
- A proactive and aggressive outreach program that includes public meetings, project newsletters and an up-to-date website detailing upcoming opportunities and the process for getting involved
- A requirement for subcontractors and consultants to subcontract with certified small business firms and provide appropriately sized subcontract opportunities for small businesses
- Access to information and technical staff to provide interested SB/DVBE/DBE/MB firms adequate information to prepare bids
- Invitation to self-register in our electronic vendor database to showcase their interest and capabilities, and receive consistent communications about contract opportunities and outreach events
- Effective management of subcontractor performance through consistent, comprehensive monitoring and field visits to verify that work committed to SB/DVBE/DBE/MB firms is actually being performed by SB/DVBE/DBE/MB firms
- A comprehensive monitoring and reporting process that captures lower SB/DVBE/DBE/MB participation



Our team participated in several networking events for Construction Package 4.





BID PACKAGING SIZED FOR SMALL BUSINESSES

Implementing a process to evaluate contract opportunities on an individual basis is a key strategy for inclusion of certified SB firms. Based on the results, our team will create appropriately sized trade packages by identifying work packages small businesses can perform or breaking larger packages into smaller ones. This strategy will enable more opportunities for bidding and performing the work while assisting in ensuring maximum participation from SB/DVBE/DBE/MB firms. We will also target certain procurements for only small businesses in areas that we know small businesses have a concentration of skills.

We will require subcontractors to meet the same SB commitment and use SB/DVBE/DBE/MB firms for their work. Our subcontractors will create opportunities for small business firms to fulfill lower-tier subcontracting work elements. We will serve as business match-makers to help identify potential contracting and mentoring opportunities.

PROMPT PAYMENT AND RELEASE OF RETENTION

Our policy is to manage risk while creating fair and manageable payment terms for smaller subcontractors. We look at various aspects involved such as timing of the specialty work and quality implications to ease the financial burden for small businesses. As done in similar projects, our team can often reduce or incrementally release retention early to our small subcontractors. We will never ask for more retention or longer terms than the prime contract asks of us. In many instances, we recognize the need for flexible payment schedules for small firms. Therefore, despite the prompt “pay when paid” rule, we strive to pay our subcontractors, especially small firms, before we are paid.

OUTREACH

We will use extensive outreach to connect with and educate the SB/DVBE/DBE/MB community about the tremendous opportunities on the project, which is key to enhancing participation. Meeting the SB/DVBE/DBE/MB goals on this project will require the continued growth of a pool of ready, willing and able SB/DVBE/DBE/MB firms with the capacity to perform the required services.

In addition to considering the firms currently in our database, we will conduct outreach and training to certified SB/DVBE/DBE/MB firms as well as the entire small, minority and female business community through:

- Partnering with the Authority, the Associated General Contractors, other industry groups, and minority and female associations
- Advertising using our project website and social media
- Hosting SB/DVBE/DBE/MB network sessions, similar to our August, September and October 2015 events and the sessions conducted for other pursuits in Texas, Georgia and North Carolina

We've Done It Before

Segmenting Project Creates Participation Opportunities

Ferrovial Agroman constructed the North Tarrant Expressway Segments 1 and 2 project by segments, with work in all of the segments beginning simultaneously. In addition to significantly accelerating the schedule, this approach created opportunities for small and disadvantaged business enterprise firms, allowing the firms to competitively bid on and manage the resulting smaller construction packages.

COMMITMENT

PACKAGES FOR SMALL BUSINESSES

We will develop packages sized to support small, disadvantaged and disabled veteran business firm participation. All subcontractors will also be expected to provide second- and third-tier opportunities sized for small businesses.

BONDING EDUCATION PROGRAM

We will implement a bonding education program in conjunction with the U.S. Department of Transportation's small business program.





DBE Outreach Started for Construction Package 4

We commit to exceeding the SB/DVBE/DBE/MB goals and recognize the need to solicit participation early and consistently. Our team continued its outreach efforts since Construction Package 1 by participating in numerous additional outreach events throughout the state including presenting on specialized topics (such as principals of bonding, good estimating practices, design-build and alternative procurement) at small business events. For Construction

Package 4, our team has already:

- Conducted SB/DVBE/DBE/MB firm meet-and-greet sessions in Bakersfield on August 17, in Visalia on September 11 and in Wasco on October 12
- Participated in the Valley Small Business Event on August 5 and other events throughout 2013, 2014 and 2015
- Contracted with The Solis Group (DBE) to assist with our proposal outreach and development activities
- Implemented continual solicitation of potential SB/DVBE/DBE/MB firms
- Created a database of local interested certified and potential SB/DVBE/DBE/MB firms that are capable subcontractors or suppliers

- Serving as an information center by providing links on our project website to the California Unified Certification Program and distributing information about certification with California High-Speed Rail-recognized agencies — the California Unified Certification Program, California Department of General Services and the U.S. Small Business Administration
- Partnering with the local certification agencies to facilitate access, answer questions and provide encouragement

VISITOR'S CENTER

In addition to the public communication functions described in *Section 1.D – Effective Communication Approach and Commitments*, the center will offer SB/DVBE/DBE/MB and employment assistance by appointment.

CERTIFICATION SUPPORT

We will help firms obtain certification by giving them information on the certification requirements and application process. We will also encourage firms to expand their certifications to additional work codes. As mentioned earlier, we will partner with the local certification agencies to assist with streamlining the process through workshops and informational sessions.

TRAINING PROGRAMS

We will train, utilize and aspire to build work capacity in SB/DVBE/DBE/MB firms. Our goal is project success and to achieve this goal our team will implement our Small Business Capacity Building Program that has been successfully used on other projects. Project orientations will familiarize employees from all firms (ours and subcontractors) with site and project requirements (safety, environmental, technical and administrative) and explain our expectations for their work. We will also encourage SB/DBE/DVBE/MB firms to participate in training offered by the Authority and its partners, as well as our own training program. Our Small Business Capacity Building Program consists of three phases:

- **Education Phase** – Ensuring that small businesses and SB/DVBE/DBE/MB firms are well-informed about opportunities and the expectations for performing work on this project or other HSR and heavy civil transportation projects
- **Expansion Phase** – Building capacity of small businesses and SB/DVBE/DBE/MB firms to increase the amount of work performed in their primary work category so they can effectively support our project
- **Enhancement Phase** – Building capacity and professional relationships with SB/DVBE/DBE/MB firms working on the project to facilitate opportunities to expand services beyond their primary work category and to other projects





Targeted Technical Disciplines. Training will be provided in key disciplines for the high speed rail work such as, quality, project administration, scheduling and billing. Our technical personnel will conduct hands-on training sessions with subcontractor personnel to teach specific technical skills, including site and equipment safety or specific software programs (scheduling, estimating databases).

Education Phase. Workshops will be conducted by project personnel and/or co-hosted with industry associations to help firms understand the process for doing work on design-build and federally assisted transportation projects, including the prerequisites and industry practices.

Enhancement Phase. Workshops will focus on specific work elements to expand the capacity and capability of key small subcontractors for potential additional work with the Authority, Ferrovial Agroman, Griffith and our other major subcontractors. Our ability to foster relationships with key SB/DVBE/DBE/MB firms (as we have done with our lead designer, OTHON) encourages growth and excellence. We will help participants recognize opportunities, identify challenges, create action plans, train in key areas and access new, cost-effective suppliers.

Bonding and Insurance Workshops. We will continue our partnership with the U.S. Department of Transportation Bonding Education Program and the Surety and Fidelity Association of America. As a key stakeholder, we will customize a contractor readiness program for the project. This partnership has been successful on other projects to introduce key bond agents to small contractors and also help firms understand bonding and insurance requirements, as well as performance aspects such as bidding, estimating, scheduling and administrative requirements. This program offers SB/DVBE/DBE/MB firms direct access our project team members, including bonding and insurance specialists.

Workshop Administration. We will assign qualified instructors, conduct pre-registration, prepare hand-out materials and keep records about who attends each workshop. Depending on the phase of the program, workshops will be held on a regular basis, at least quarterly during for the earlier phase and more frequently for more specific sessions in the later phases. Trainings co-hosted with other small business-focused organizations may occur more or less frequently, depending on the topic and the need for the training.

REPORTING AND EVALUATING EFFECTIVENESS OF THE PROGRAM

We will subcontract significant portions of the work, which will provide maximum opportunities to local and SB/DVBE/DBE/MB firms to participate. Obtaining certified SB participation on a design-build project requires ongoing commitment as the design and construction packages roll out. Stringent monitoring and record-keeping will substantiate success. We will use the B2GNOW software

Workshops and Technical Assistance



SH 130
SEGMENTS 5
AND 6

Our team developed a small business mentor-protége program that gave firms the opportunity to enhance their growth potential by learning standard construction business practices, and receiving mentoring and networking with project staff as well as other firms in the industry. Protégés received vital information, tools and resources from mentors who were subject matter experts in their field and were dedicated to sharing their expertise and guidance in various areas of business.

As part of this program, the team purchased specialized paving equipment required for the echelon-style paving operation and brought in outside experts to train the employees of the asphalt paving contractor, a local woman-owned business.





Meeting DBE Commitments

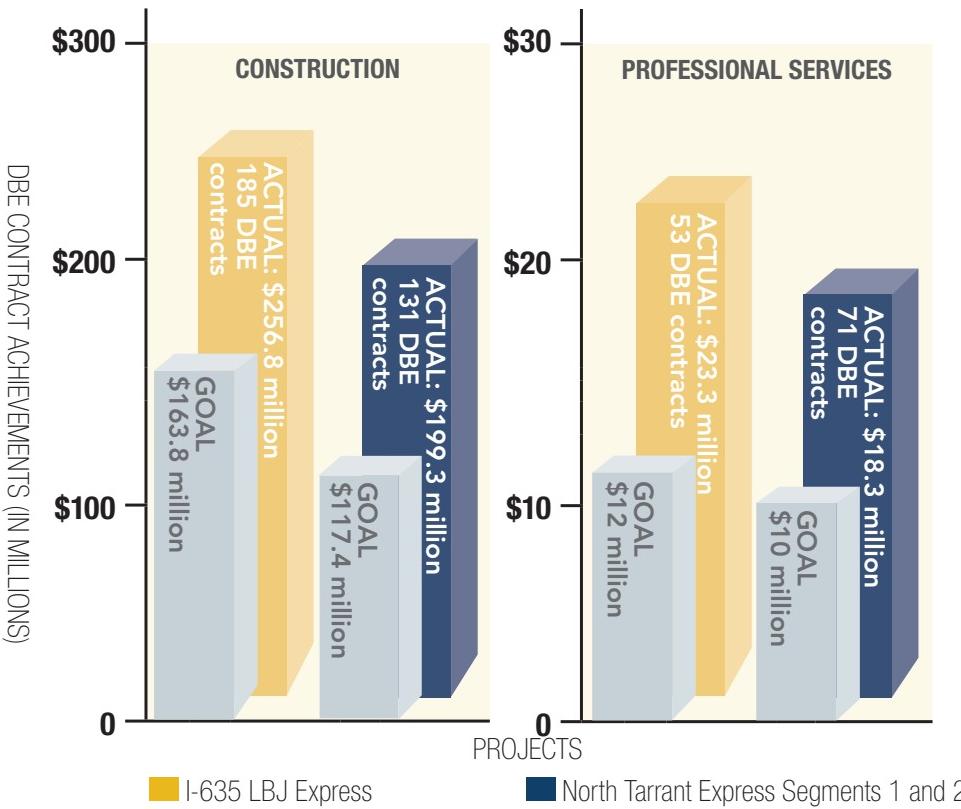


PROVEN DBE TRACK RECORD

SH 130 Segments 5 and 6: local firms received 98 percent of the subcontracted work including DBE participation of approximately 14 percent, exceeding the 12 percent DBE goal.

I-635 LBJ Express and North Tarrant Express Segments 1 and 2: Exceeded DBE participation goals significantly as shown in Figure 4-2.

Figure 4-2: Example DBE Performance



system for subcontractor management to track our outreach events, monitor DBE certifications and support DBE participation and payment reporting. At a minimum, we will track our progress toward exceeding the contract goal in both monthly and annual SB/DVBE/DBE/MB progress reports as well as proactively conduct our own consistent commercially useful function reviews and on-site visits. We will submit our reports using the Authority's monthly SB Subcontractors Paid Report Summary and Payment Verification Form (Form 103), narratives and an annual report on or before August 1 of each year.

B. SB/DVBE/DBE/MB COMPLIANCE OFFICER QUALIFICATIONS

Angela Berry-Roberson will serve as the team's SB/DVBE/DBE/MB Compliance Officer (SBCO). Reporting directly to Project Manager/Director Alvaro Gomez-Muro, she will develop, implement, monitor, and manage the day-to-day operations of the small business performance plan to ensure compliance with the Authority's SB/DVBE/DBE/MB goals, including the additional duties and responsibilities described in the program's Subpart E: Design-Build Provisions, SBO Duties and Responsibilities.

SBCO QUALIFICATIONS. Angela Berry-Roberson brings more than 20 years of experience in SB, DBE, on-the-job training (OJT) and equal

employment opportunity program compliance and management, specifically on large transportation infrastructure projects. She served as the DBE manager on three multi-billion managed lanes projects where she is responsible for developing, implementing and managing small business and DBE strategy and also verifying OJT and EEO compliance. Angela and her department work closely with construction, procurement and other departments to promote awareness of the SB/DBE/OJT/EEO programs including conducting extensive outreach





and monitoring contract compliance. She has a proven track record of developing award-winning DBE programs.

Angela has significant experience with managing and implementing small business and DBE programs for rail systems. As a former employee of Dallas Area Rapid Transit, Angela was responsible for the compliance and the overall DBE and minority- and woman-owned business enterprise (M/WBE) diversity requirements for several phases of the light rail and commuter rail systems. As a consultant, Angela was later responsible for DBE and M/WBE outreach and compliance on the Dallas Area Rapid Transit Orange Line. Overall, Angela has monitored more than \$1 billion of preconstruction and construction opportunities for DBE/M/WBE firms on rail projects and verified the goals were met.

SBCO ROLE AND RESPONSIBILITIES. SBCO Angela Berry-Roberson is responsible for developing, implementing, monitoring and managing the day-to-day operations of our team's SB/DVBE/DBE/MB program performance. She and her team will be 100 percent dedicated to the leadership and management of the team's SB/DVBE/DBE/MB and CBA programs. Specific responsibilities include:

- Serving as our team's SBCO, leader and focal point for all SB/DVBE/DBE/MB outreach, strategy, communications, training and supportive services
- Verifying credentials of SB/DVBE/DBE/MB firms and introducing them to our design and construction teams
- Ensuring all team members, including subcontractors, fully understand the program, its goals, objectives and contractual commitments, including compliance reviews
- Reporting SB/DVBE/DBE/MB progress towards achieving the goals and developing and leading recovery activities to correct any underutilization trends
- Attending meetings with the Authority's SB Liaison Officer, Business Advisory Council and others to identify strategies to achieve the goals
- Keeping the SB Performance Plan up-to-date with the current business environment and the latest revisions to the applicable State and federal laws and regulations and ensuring the SB Performance Plan is responsive to and in compliance with the regulations, including, but not limited to, the Executive Order S-02-06, Title VI and the best practices of 49 CFR Part 26, as applicable.
- Coordinating CBA compliance, with the assistance of a jobs coordinator

SB/DVBE/DBE/MB TEAM. As shown in Figure 4-3 on the next page, Angela Berry-Roberson will be supported by a team of at least four (at peak of construction) who are experienced in outreach, SB/DVBE/DBE/MB and CBA programs.

"The project team's genuine commitment to DBE capacity building has allowed our company the opportunity to broaden our work scope and capabilities in other areas of the highway industry."

— Berry Assefa, Managing Partner, Indus Construction Services, LP DBE subcontractor (I-635 LBJ Express and North Tarrant Express Segments 1 and 2)

We've Done It Before

DBE Experience and Results

Angela Berry-Roberson, Corporate DBE Manager for Ferrovial, will lead the DBE and civil rights team. She is a nationally recognized expert in affirmative action and diversity program development and implementation with 20 years of experience in DBE programs

DBE team members bring 50 years combined experience. The team has conducted more than 400 DBE outreach events and 150 presentations resulting in \$500 million awarded and paid to more than 100 DBE firms in the past five years.





Figure 4-3: SB/DVBE/DBE/MB Team
Full-Time Personnel

FTEs	Team/Position
1	SB/DVBE/DBE/MB Compliance Officer
4	SB/DVBE/DBE/MB Coordinators
5	Total

Small Business Bonding Assistance

U.S.
DEPARTMENT OF
TRANSPORTATION

On the I-635 LBJ Express, North Tarrant Express Segments 1 and 2 and other projects, we partnered with the U.S. Department of Transportation and the Surety & Fidelity Association of America on their bonding education program to provide greater access to surety firms and technical assistance for bonding preparation.

On SH 130 Segments 5 and 6, we provided small businesses with flexible bonding and retainage requirements to encourage and facilitate their participation in the project.

Cash Flow Management

It can often be a challenge for suppliers and subcontractors to procure and finance their work. We will work with subs and vendors to create favorable payment terms, help manage cash flows and work with third party suppliers to minimize risk for all involved.

C. INNOVATION IN ASSISTANCE TO SMALL BUSINESS

We routinely provide assistance to SB/DVBE/DBE/MB firms to help them successfully perform as part of our team and stretch to develop new capabilities. We help firms overcome barriers, such as the inability to obtain bonding, insurance, financing or technical assistance. Angela Berry-Roberson and our team have experience in implementing innovative contracting and procurement strategies that advance the utilization of SB/DVBE/DBE/MB firms. We commit to using the following strategies:

- **Training Programs and Supportive Services** – As described on page 90, our program includes training programs to assist SB/DVBE/DBE/MB firms to understand how to do business with our team and the Authority
- **Subcontractor Goals** – Except for specific exceptions based on the scope of work, each subcontractor will be required to meet the SB/DVBE/DBE/MB goals for their own work
- **Bid Package Sizing** – Creating packages sized for SB/DVBE/DBE/MB firms by understanding the capabilities of the SB pool and breaking larger contracts into smaller ones
- **Small Business Set-Aside Procurements** – Soliciting bids from only SB/DVBE/DBE/MB firms for certain work where we have determined that the market has sufficient capacity to provide competitive bidding from multiple firms
- **Prompt Payment** – Establishing a prompt payment process to assist SB/DVBE/DBE/MB firms, at any tier, including release of retention
- **Flexible Bonding** – Setting bonding requirements based on available market capacities and accepted risk management practices and using contract management to allow smaller work packages to help small businesses build capacity
- **Program Forums** – Participating in forums sponsored by the Authority and its partners focused on SB/DVBE/DBE/MB issues and best practices
- **Partnering with Local Advocacy Groups** – Working with minority, disabled veteran, women and contractor groups, and industry and local associations to expand knowledge about the project opportunities
- **Certification Support** – Meeting with businesses one-on-one to assess their certification levels and suggest additional NAICS codes or certifications that could be pursued
- **CBA Support** – Providing more intensive services for small businesses (especially out-of-area and/or non-union contractors) such as providing introductions to union representatives and helping contractors understand the specific CBA requirements (such as what to look for in a cooperation agreement, how to ask for worker referrals, how and when to register workers for trust funds)





OUTREACH, WEBINARS AND OTHER PROMOTION. We will develop and implement methods for outreach and promotion of all subcontract opportunities to SB/DVBE/DBE/MB firms, including developing brochures and other written material and marketing tools that promote opportunities on the project. Active for the past two years, our website (www.californiarailbuilders.com) provides information about our team and networking events, and invites firms to join our database and mailing list. In addition to the typical networking events, we will provide webinars that allow firms to access the information about opportunities, certification and other qualifications requirements from their own offices.

We will also use small group and one-on-one meetings to help provide targeted information and exchanges. For example, on the I-635 LBJ Express, we conducted small group meetings focused on civil work, trucking and miscellaneous concrete work; when appropriate, we invited the estimators or other technical staff to attend the meetings and provide the detailed technical requirements that helped the firms fully understand our requirements and expectations. We also conducted one-on-one meetings with firms to discuss their qualifications, certifications and opportunities.

For this project, we expect to establish standing dates for meeting with new firms — such as the third Thursday of each month (or more often during the project peak). Before meeting with our technical staff, our small business team will prequalify the firms to ensure that they have their insurance, bonding and certifications and that they come prepared to shine.

FINANCIAL AND BONDING ASSISTANCE. We will provide flexible bonding and retainage requirements to encourage and facilitate small business participation. We will expand our partnership with the U.S. Department of Transportation Office of Small Business and the Surety & Fidelity Association of America as a key stakeholder for its Bonding Education Program. The Bonding Education Program provides access to local sureties and hands on bonding assistance and also arranges for SB/DBE firms to receive vital information and education about the requirements and benefits of bonding.

We will also perform the following:

- Provide referrals to resource agencies (such as the U.S. Department of Transportation's regional Small Business Technical Resource Center) that can assist with obtaining bonding, insurance and lines of credit
- Provide training and resources that facilitate bonding and insurance, including contact information
- Allow lower retention, or bonding for retention
- Consider flexible bonding options for piecemeal scopes of work
- Package or stage contracts into smaller scopes of work
- Provide assistance with obtaining necessary equipment, supplies, materials, or related assistance or services

Local Office with Existing Relationships

With an established local office in Kern County, Griffith Company brings existing relationships with unions and small businesses, and offers a unique understanding of the economic diversity throughout the Central Valley Region.

COMMITMENT

ASSISTANCE TO SB/DVBE/DBE/MB FIRMS

We will offer the following to help ensure the success of our small business partners:

- Training programs and supportive services
- Requirements for SB/DVBE/DBE/MB participation at all tiers
- Bid packages sized for small firms
- Capacity set-asides
- Prompt payment
- Participation in HSR program forums
- Partnering with local advocacy groups
- Certification support
- CBA support
- Bonding assistance or flexible bonding

Expanding Supplier Capacity

It can often be a challenge for suppliers to transport materials beyond their normal capacity. We can mitigate this by purchasing trailers and other vehicles to supplement their fleet.





Figure 4-4: Projected Work Areas for SB/DVBE/DBE/MB Firms

Work Categories

- CBA administration
- Public outreach support
- SB/DVBE/DBE/MB outreach, training and support services
- Bridge construction work
- Construction survey
- Concrete flatwork/pavement
- Demolition and removal
- Drainage
- Electrical/lighting/signalization
- Environmental
- Erosion and sediment control
- Excavation/earthwork
- Ground maintenance services
- Guardrail
- Landscaping
- Material testing
- Metal and precast material supply
- Quality assurance/control
- Rebar/reinforcing steel
- Technical design and engineering
- Traffic control
- Trucking
- Utility construction

D. COMMITTED SB/DVBE/DBE/MB TEAM MEMBERS

SELF-PERFORMED AND SUBCONTRACTED WORK. We will consider self-performing work that is critical to the project so that we are in the best position to manage the risk. We expect to subcontract portions of all of the work to best manage risk while providing the most opportunities for the SB/DVBE/DBE/MB firms in the market. We will size contracts to attract SB/DVBE/DBE/MB and local firms.

Projected Areas of Work for SB/DVBE/DBE/MB Firm Utilization. Figure 4-4 identifies additional areas of work for potential SB/DVBE/DBE/MB participation. A portion of the DBE participation may be met through our lead design firm, OTHON, a firm that has worked with us as a DBE on Texas Department of Transportation projects. We have already committed almost 5 percent of our contract amount to SB/DBE/DVBE/MB firms as follows:

- **Bond and Kennedy, Inc. (SB/MB)** – Procurement support (<1 percent)
- **G&C Equipment Corporation (SB/DBE/DVBE)** – construction materials (<1 percent)
- **JMA Civil, Inc. (SB/MB)** – BNSF Railway coordination and special track design (<1 percent)
- **Katch Environmental Inc. (SB/DVBE)** – Type I and Type II hazardous soils excavation and disposal (2.5 percent)
- **MARRS Services Inc. (SB/DBE)** – Hazmat support, permitting and environmental support during design (<1 percent)
- **Unico Engineering, Inc. (SB/DBE/MB)** – Verification, validation and self-certification (1 percent)
- **USC Supply (SB/DVBE)** – Construction materials (<1 percent)

Effective Outreach Programs

DBE PROGRAM RECOGNIZED

The Texas Department of Transportation's Office of Civil Rights awarded Ferrovial Agroman their Small Business Advocacy Award in 2013 for outstanding DBE service on the I-635 LBJ Express and North Tarrant Expressway Segments 1 and 2 projects. Ferrovial Agroman conducted more than 200 outreach events, led more than 50 community presentations and, to date, has awarded more than 350 DBE subcontracts totaling nearly \$500 million.

Including winning the Regional Hispanic Contractors Association 2014 General Contractor of the Year award, Ferrovial Agroman has been recognized at the local, state and federal level for its efforts and commitment to diversity contracting. Recently, the company was recognized by the Dallas/Fort Worth chapter of the Women's Transportation Seminar as a leader in promoting advancement and growth for women in transportation.





KICK-OFF NETWORKING MEETINGS. Within 60 days of notice to proceed, we will host SB networking meetings with representatives of SB firms and the Authority to ensure all parties understand and are acclimated to the SB Program requirements, including the commitments made in our small business plan.

E. COMMUNITY BENEFITS AGREEMENT

The Community Benefits Agreement (CBA) Policy directs its contractors to “provide meaningful employment opportunities and construction careers to those residing in the disadvantaged areas and/or currently facing barriers to employment.” From their office in Kern County, Griffith has developed a unique perspective of the economic diversity throughout the Central Valley Region. Griffith has established relationships with many local and disadvantaged small businesses, and our team is committed to maximizing benefits to the community.

Approach

The CBA is designed to establish a framework for union-contractor partnership, and we will begin establishing that partnership immediately upon project award. CBA requirements will be discussed with all potential subcontractors during bid solicitation and all subcontractors of any tier will be required to submit Letters of Assent to the CBA upon signing a contract. We will communicate with the signatory unions about the expected project schedule, and will provide information about subcontractors’ detailed work scopes and job assignments at a pre-job conference. Because the work is expected to be released in several bid phases and subcontractors will be identified over time, additional conferences will be held to disclose additional work packages in advance, providing local unions time to exercise their rights to challenge jurisdiction under the CBA. Our team (including subcontractors) will abide by any jurisdictional decisions that are made according to CBA Article XI by arbitrators under the *Plan for the Settlement of Jurisdictional Disputes in the Construction Industry*.

NATIONAL TARGETED WORKER/DISADVANTAGED WORKER COMPLIANCE

We are committed to meeting the targeted hiring requirements contained in the CBA of 30 percent of project hours performed by National Targeted Workers and 10 percent by Disadvantaged Workers. Under the direction of Angela Berry-Roberson, we will assign a jobs coordinator who will work with the subcontractors and production personnel to plan and administer compliance with the CBA. We will work with the Authority’s jobs coordinator, Pat Padilla (Padilla & Associates, Inc.) to design and implement the details of our approach.

COMMITMENT

LOCAL WORKERS

We will engage in active outreach to the community to achieve compliance with the CBA. We will use targeted outreach and advertising to increase our reach to CBA-targeted hires. This would include meeting with organizations that represent the targeted hires and local advertising in Spanish and English within affected communities.

“Angela Berry-Roberson and her team of DBE coordinators have gone above and beyond to help us understand our role as a DBE, make us aware of opportunities through local association memberships, and keep us informed of all upcoming opportunities relevant to us.”

—Sharon Douglas, President,
Bradley Douglas Construction
Services, LLC DBE subcontractor,
I-635 LBJ Express





TRADE ORGANIZATIONS/HIRING HALLS

We are committed to working with local organizations/hiring halls. The CBA is signed by dozens of labor organizations that all agreed to recruit and retain Targeted Workers. Presenting our anticipated hiring needs to these organizations in advance will provide the greatest opportunity for Targeted Worker availability. Our team will develop a referral program to supplement the hiring halls as needed.

Serving as a key corridor between Fresno and Bakersfield, Construction Package 4 is located between two major regional employment centers. Our team will conduct bid-item specific outreach meetings for potential employees to highlight current and upcoming opportunities. We will engage local businesses and workers through:

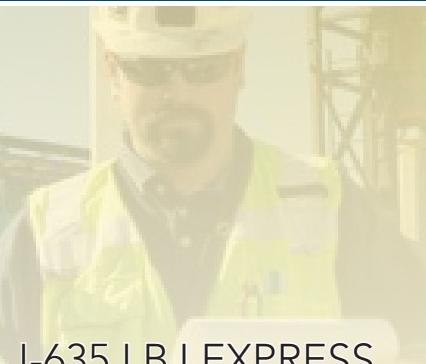
- Public informational meetings soliciting input and responding to local needs and concerns
- Communication with community leaders and the public to keep them well informed of project activities
- Project newsletters, a well-maintained and up-to-date project website, and, in coordination with the Authority, the use of social media such as Facebook and Twitter
- Employment fairs that match individuals with consultants and subcontractors
- Advertisements with print and online media channels
- Providing visitor center staff who will assist prospective employees with identifying upcoming employment opportunities and help match interested personnel with consultant/subcontractor firms

SUBCONTRACTOR REQUIREMENTS AND SUPPORT

Much of the hiring for the project will be in the hands of our subcontractors. We will ensure that each subcontractor, at every tier, signs the Letter of Assent and understands the provisions of the CBA that is a part of their contract. Because meeting the targeted/disadvantaged requirements is a project-wide goal, we will carefully evaluate the work and determine scopes of work that can exceed the National Targeted Worker and Disadvantaged Worker requirements. By communicating those enhanced requirements to the contractors performing those scopes, we can compensate for certain specialty work that may have more difficulty meeting the requirements, and set expectations accordingly at an achievable level for that work.

We will require subcontractors to submit manpower plans with their proposals, showing the number and classification of workers required, and therefore the number of targeted and disadvantaged workers required.

Worker Outreach and Training



I-635 LBJ EXPRESS

Our team partnered with several diverse industry groups, organizations and chambers to educate and reach out to the local workforce. Additional outreach efforts were performed in conjunction with local schools, especially female students regarding science, technology, engineering, mathematics and construction career opportunities associated with the project. The team and several subcontractors participated in the Texas Department of Transportation's On-the-job Training and Supportive Services Program.





TARGETED WORKERS

We will download the most current list of targeted worker zip codes (the Authority is using the Los Angeles County Metropolitan Transportation Authority's list, found at <http://www.metro.net/interactives/datatables/deod/>) and provide it to all potential subcontractors. Many of the zip codes are in Bakersfield, Fresno, Wasco and other Central Valley cities to be served by the project. We will research which of the zip codes fall within the jurisdictional area of the unions signatory to the CBA (the jurisdictional area varies by union) and provide the disadvantaged worker criteria to all potential subcontractors.

NONUNION CONTRACTORS

To help comply with the CBA, nonunion contractors will be able to bring five core workers with them, to be used in a one-to-one ratio with local union referrals. We will require subcontractors to identify whether members of their existing workforce qualify as either Disadvantaged or Targeted at the time of submitting their proposals, and instruct them to prioritize those individuals as their core workers if possible.

Union Contractors. Union contractors not directly signatory to one of the locals on the CBA (for example, signatory to the Chicago Ironworkers local but not the Kern County local) will also be able to bring a small number of their own workers with them, subject to individual union portability provisions. These subcontractors shall identify the workers they would like to bring, and which workers qualify as disadvantaged or targeted workers, with targeted workers prioritized. Unlike most labor agreements, a large number of out-of-area locals from Los Angeles and San Francisco areas are directly signatory to the CBA. A Los Angeles company would likely be able to bring its own workforce to work on the project, but will be requested to prioritize disadvantaged and targeted workers.

Union contractors who are directly signatory to the locals with jurisdiction over the project (generally Central Valley-based contractors) will be able to perform with their own workforce. We will also required these companies to identify which of its workers qualify as disadvantaged and targeted, and prioritize those workers.

Union Referrals. Additional workers needed must be referred by the union locals with jurisdiction over the project area. Our jobs coordinator (in cooperation with the Authority's job coordinator) will work with the building trades associations (including the Kern/Inyo/Mono Council, Fresno/Madera/Tulare/Kings Council, the Southwest Regional Council of Carpenters) to communicate workforce needs in advance. An analysis of the number of journeypersons on the union rolls, along with the number expected to be available for dispatch to the project will allow potential resource shortfalls to be identified well in advance of the staffing requirements. Together with the unions, we will develop a strategy recruiting workers into the local unions (such

Annual Summer Intern Program



On the I-635 LBJ Express, the design-build team sponsored and participated in an annual summer internship program (the Emmett J. Conrad Leadership Program) intended for civil engineering students and other related fields to gain practical experience in construction management. Under the direction of senior construction managers and professional engineers, interns participated in all aspects of construction management. Twenty-five students participated in this program, six of whom have returned to the company in full-time careers after graduation.

On the North Tarrant Express Segments 1 and 2, 25 students participated in this program, with one returning to the company in a full-time career position after graduation. On the North Tarrant Express Segment 3A, 11 students participated in the program.





Supporting Local High Schools

NATIONAL MATH AND SCIENCE INITIATIVE

On the North Tarrant Express Segments 3A project, our team partnered with the National Math & Science Initiative (NMSI) to work with three high schools along the corridor to provide training, testing and incentives for students and teachers to further their knowledge in the fields of science, technology, engineering and math and gain an advantage in preparing for college. Ferrovial Agroman works with NMSI to continue implementing a campus-based mentoring program, providing one-on-one interaction between company engineers and students. The financial commitment to the NMSI program is \$300,000.

Similarly, we partnered with the NMSI to work with high schools along the North Tarrant Express Segments 1 and 2 corridor, making a financial commitment totalling \$800,000. Ferrovial Agroman and OTHON also worked with NMSI to implement the first campus based mentoring program, providing one-on-one interaction between company engineers and students.

as inactive members, relocating members from other jurisdictions, graduating apprentices, or new hires into the apprenticeship programs) for referral to the project. With aggressive forecasting and recruiting, we expect to meet the targeted worker goals and increase the probability that targeted workers are available when we request workers from the unions.

Apprentices. California Labor Code §1777.5 requires that apprentices be used in public works construction, generally at a ratio of one apprentice hour to five journeyman hours. These apprenticeship requirements represent an opportunity to secure entry into the trades of targeted/disadvantaged workers, even for locally signatory contractors who use all their own journeypersons. Our jobs coordinator will help source interested targeted/disadvantaged workers from local jurisdictions. We commit to interview interested workers and/or to introduce them to the appropriate subcontractors for sponsor into the applicable trade.

ENSURING COMPLIANCE

We will use a labor tracking software such as LCP Tracker to track compliance and perform an analysis using certified payrolls to determine compliance with disadvantaged/targeted requirements. Targeted/disadvantaged compliance will be discussed regularly at construction meetings, and our subcontracts will include a requirement to submit and follow a recovery plan for shortfalls. Recovery plans could include any or all of the following:

- Using additional union referrals to capture additional targeted/disadvantaged workers
- Shifting workforce between tasks to maximize targeted/disadvantaged presence on the job
- Requesting and using additional apprentices up to the number allowed by the apprentice program
- Conducting compliance meetings with local union leadership to discuss how to find and refer additional workers
- Sharing scope between subcontractors so that those with more targeted/disadvantaged workers have a greater share of the on-site labor
- Subcontracting portions of work to a firm with more targeted/disadvantaged workers.





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